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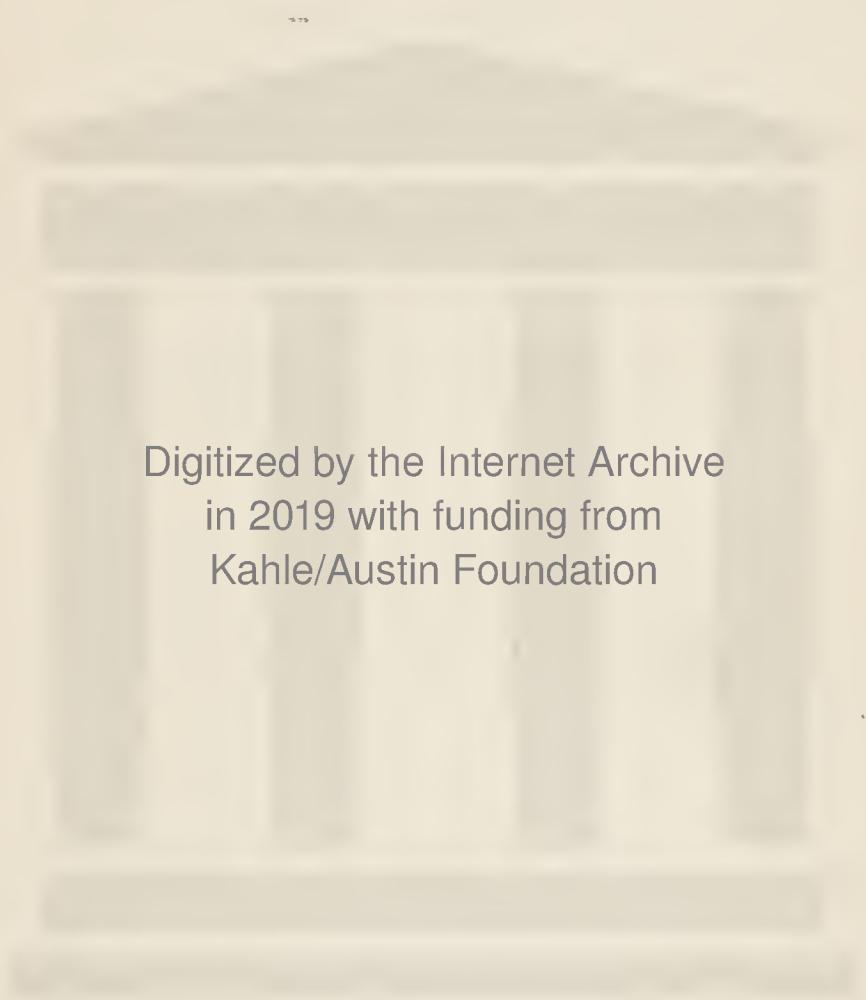


Robert Baldwin Fordyce Barr

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R.W. Mason

Frontispiece, Vol. I.

THE
DOVER PATROL
1915—1917. By ADMIRAL SIR
REGINALD BACON, K.C.B.,
K.C.V.O., D.S.O.

WITH 101 ILLUSTRATIONS, 12 CHARTS
AND 21 PLANS AND DIAGRAMS

VOL. I

LONDON
HUTCHINSON & CO.
PATERNOSTER ROW

TO
MY OLD COMRADES
OF THE
DOVER PATROL

259944

P R E F A C E

THE reasons why certain operations were carried out by the Dover Patrol during my period of command of nearly three years, and were carried out in a particular manner, and why other operations were not carried out, are known to me only. In the interest of historical truth, and of the reputations of the officers and men, I have felt impelled, therefore, to prepare an account of the work of the Dover Patrol.

The interesting part of the history of war to a student, as distinct from the reader in search of sensation only, lies in the reasons that prompted action or inaction, and this is what is usually most obscure in the records, especially naval records, of past years. At Dover during 1915, 1916 and 1917, more operations were initiated and carried out than under any naval command since the wars at the beginning of last century. It may, therefore, safely be assumed that the history of the Dover Patrol during those years will have a value to future students of naval history.

It is interesting to speculate how the historical verdict of years to come will differ from current opinions on the conduct of the late war at sea. Full credit will certainly be given to those who were responsible for the existence of the Grand Fleet, for the superior armament of its ships¹ over

¹ Every ship is a compromise between the competing demands for gun-power, torpedo armament, armour, engine-power, habitability, etc., and British ships were much more heavily armed and generally speedier than German ships, in short, better offensive fighting machines. The German ships had offensive power and habitability to a marked degree sacrificed to afford protection against vital damage from a mine or a torpedo. The British ships were built to keep the sea for reasonably long periods; the German ships to rush out into the North Sea and at once return to harbour.

those of the enemy, and for its concentration in the North Sea. Three names are indissolubly associated with this foresight. First and foremost, the historian will remember Lord Fisher, to whose genius and almost uncanny prevision we owe the all-big-gun ship of high speed. While men of narrow minds and constricted views were clamouring for little ships, small guns—two, three or even four varieties of them—and slow speed, crying aloud against our leading the race in size of armaments, advocating the hail of small projectiles as more effective than the shattering effect of the heavy projectile, and trying to prove that slow speed was quite as good as fast speed, Lord Fisher led us from the 12-inch to the 13·5-inch up to the 15-inch gun, and from the old King Edward class to the Dreadnoughts and super-Dreadnoughts and from the Shannons to the Invincibles and upwards to the *Queen Mary*. Whenever, during the war, I thought of how nearly that clique of would-be experts succeeded in carrying the small-gun versus the large-gun ship I had a cold shiver down the spine. Had they succeeded we should now be a German province! Why did von Spee sink the *Good Hope* and the *Monmouth*?—the large gun and the long range! Why did the Invincibles sink von Spee?—the larger gun and the longer range! And so on through the war. We *had* to be superior to the Germans to maintain our national existence.

The genius of Lord Fisher swept aside all the husks and held fast to the kernel of truth that the heaviest gun meant victory. The Germans followed our progress with halting steps. The shallow waters of the Baltic, the Kiel Canal and its locks, the disinclination to give up the Krupp breech-block, necessitating the use of brass cartridge cases for the charges, which grew more and more unwieldy in size and weight with the advance in the calibre of the gun—all militated against increasing the weight of the guns carried by their ships and so handicapped them in their bid for equality of sea-power. This Lord Fisher knew, and, pressing the advantage of circumstances silently and to the uttermost, he pre-

pared for the birth and sturdy growth of the Grand Fleet, which in the grim end the Germans found facing them on the day of battle. Mr. Reginald McKenna was closely associated with this development; in fact, it was generally credited at the time that for three days he was practically outside the Cabinet while fighting the Navy's battle at what, in reality, was the most critical period of our history. Then Mr. Churchill carried on the work, and, in our day of peril, with his characteristic courage, authorised without hesitation the mobilisation of the Fleet at a moment when hesitation might have appeared to be excusable, but would have been fatal.

For these reasons these three names, in particular, will be indissolubly associated in history with our battle fleet supremacy during the war—with that Grand Fleet appropriately so called. There it lay at Scapa in the North Sea, with every muscle strained and nerve vibrating. It was like a spear poised in the hand of a giant ready to be hurled at the wild beast offending against humanity should he venture from his den. Once he crawled out, and Lord Jellicoe's far-reaching victory of Jutland dealt him a blow which sent him snarling back with many wounds which, eventually festering from inactivity and broken hopes and lowered pride, led to his dishonourable and inglorious end.

And what of Dover? That is the story with which this book is concerned. The Grand Fleet was in the far North; Commodore Tyrwhitt had a force based on Harwich; and then, farther south, was the Dover Patrol, which held the southern exit from the North Sea as the Grand Fleet may be said to have held the northern exit.

It might be expected that an analysis of the reasons guiding the actions of the Admiral of such an important command would find a place in the official history of the war. This, I fear, is not likely, at any rate in any detail. Time passes quickly, and accurate memory has its limitations. For this primary reason, before memory fails me, I considered the

PREFACE

writing of this narrative imperative. I have endeavoured throughout to explain, perhaps at wearisome length, the reasons which prompted me to take definite action at certain moments, believing that the original memoranda may interest the more specialised reader. It was impossible while the war continued to tell the British people anything material of our efforts, difficulties, disappointments and hopes, because in so doing vital information would inevitably have been conveyed to the Germans. The narrative will show that little could be said which would not have revealed the slender nature of the forces which the Admiralty could allot to the Dover area in view of the demands of the sea strategy of the whole Empire, and will suggest that the Germans would have been able to inflict irreparable disaster on the country if the veil had been lifted in order to allay public irritation. Not only the success of our plans, but the very existence of the Dover force depended on secrecy. Now the war is over and so much can be revealed as was, from the necessarily intimate relations which existed, known to our gallant Allies, the French, Americans, Italians, Belgians and Japanese. Those who read the book must not forget that they read it in the fuller light of subsequent events, and it is well for them to bear this point in mind, since much that was obscure at the time of action, particularly in reference to the enemy's policy, may subsequently have been revealed.

The naval reader may find the chapter on operations of interest, since I have endeavoured there to give some of the chief, of the many hundreds, of principles that experience convinced me should guide an Admiral in conducting war operations. I hope this chapter may stimulate thought in those who in turn may, at some future time, command in war.

A second reason for breaking silence is that the work of the Dover Patrol has never been adequately described. Accounts of several gallant actions which fired the popular imagination have been published in the Press, but these have been merely ephemeral flashes, having little bearing

on the solid, and often monotonous, work done during the war by men who wore themselves out, or perhaps died, without any of the glamour attaching to dramatic exploits appealing powerfully to the heroic sense of their fellow countrymen.

I know that this book does not do full justice to the individuals of the Patrol. It would require a dozen volumes and a far abler pen than mine to perform such a task. Names have been mentioned in subsequent chapters, but this must not be taken as meaning that these alone deserve mention. It is impossible to include all, or even a tenth part, of those who really ought to have their names recorded. All that is possible, in so brief a review, is to describe simply the general work done, and to emphasise the fact that all who participated, whatever their ranks or ratings, deserve to share the credit.

The tale I have to tell deals with the work of a small nucleus of crews and ships of the Royal Navy and of a multitude of other men and other vessels. The men were mostly plain fisher folk; the vessels ordinary fishing craft. The little drifters—with the armament of a single rifle and a few rounds of ammunition!—who used to accompany us on our bombardments and be shelled with apparent enjoyment, had crews of hardy fellows who were seamen in the truest sense. Often they stood unarmed as outposts in the Straits of Dover, with neither gun to fight nor speed to avoid the German destroyers. In 1917 we had no less than forty-five miles of moored nets for them to look after and keep in repair in racing tides and vile weather. And they did not fail!

The Trawlers, with their brother fisher-folk, swept for mines at the rate of 250 miles of route per day, and during the three first years of the war swept a total distance equivalent to twelve times round the earth! These men saw their comrades blown up and yet went on steadily and unfalteringly with their duties. They managed the traffic like London policemen.

Then the merchant service! Thank God every day of your lives for the spirit shown by the merchant service during the war. I never thought that we should be starved by

submarines, even in the worst days of the struggle, except from one cause. I feared sometimes that the ever-present dangers of the mine and submarine might break the nerve of our merchant seamen. In the usual acceptance of the words, they did not constitute a fighting service, and the unseen perils they were suddenly called on to face might well have bred a dread sufficient to chill their hearts and make them forsake the sea. They lived up to their old traditions and saved the country!

In justice to the officers and men of the Patrol, a summarised statement may be given here of what was achieved during my period of command.

In two years and nine months, we passed 120,000 merchant vessels through the Narrows. Although we at Dover were nearer to the enemy's base at Ostend than we were to Brighton, the Patrol succeeded in guarding that life-stream of food and necessities so effectually that only one twenty-fifth part of 1 per cent. was lost by mines, and one-thousandth part of 1 per cent. by the enemy's night raids.

As to the cross-Channel traffic, we passed over 5,600,000 troops across without an accident to a single man.

The interesting feature of these traffic results is the phenomenally small force of destroyers with 4-inch guns that were in the Patrol. For two years, four was the greatest number available, and once we were reduced to a single 4-inch gun destroyer to hold the Straits, with a dozen or more German boats barely sixty miles away, each superior in armament, even to the single boat.

Twenty-eight bombardments of the enemy's positions were carried out, entirely new methods of firing and spotting the fall of shell being evolved. The shooting was so accurate that, from a range of fifteen miles and without ever seeing the coast, we were able without hesitation to bombard the dockyard in Ostend without fear of dropping a shell on a single one of the houses situated 300 yards each side of the centre of the area under attack.

Some account is also given in this history of the preparation for disembarking a division of our troops on the Belgian coast in twenty minutes ; of the 2,400-ton piers which were to have been pushed in ahead of the monitors to serve as gangways for the soldiers in landing ; and the abandonment of the scheme owing to our gallant troops being held up at Passchendaele. The moment for execution never arrived.

Three 12-inch fifty-ton guns, three long, heavy 9·2-inch guns, four short 9·2-inch and eight 7·5-inch guns were landed at Dunkirk and transported fifteen miles inland. The biggest guns were landed without a crane and taken by road, not rail, and mounted in their positions.

The longest range at which systematic firing had been carried out prior to the war by the Army or Navy was at 20,000 yards, or about 12 miles, on the range at Shoeburyness. We had therefore much pioneer work to do, as our firings had to be carried out with great accuracy at 30,000 yards, and we had to design special mountings for this purpose.

There is also the tale of the laying of mine and mine-net barrages during two summers in succession off the Belgian coast—flanking its entire length ; of the effect this had in 1916 in stopping all mining in the Channel by the enemy ; of the daily patrol we kept up for two summers and one winter within sight of Ostend and Zeebrugge—a feat that, after the loss of the *Hogue*, *Aboukir* and *Cressy*, was looked upon by many as sheer madness. The gallant work of the French forces under my orders, which deserve every praise, is briefly dealt with later.

The defence of the Downs, with one hundred ships nightly at anchor ; the work of the examination service, and lastly the ubiquity of the incomparable 6th Destroyer Flotilla, worked to the bone, but always cheery, always ready for more, holding the Channel in the face of overpowering odds, summer and winter, gale and fog, are all described, however inadequately. I have also discussed the futility of harbour blocking on the Belgian coast and described the plans that were

made by me for attacking the Mole at Zeebrugge, and providing a blocking diversion there and at Ostend; I also mention the causes of the failure of and heavy casualties incurred in the Mole landing as attempted in 1918. The laying of the cross-Channel barrage from the Goodwins to Dunkirk was a herculean task, and the emplacement by us of the now famous mine barrage from Folkestone to Grisnez, of which so much was heard early in 1918, after I had left Dover, is described; it completely closed the Channel to submarines.¹

The work of the Air Service is not omitted from this record of the Dover Patrol, though it is dealt with briefly. There is a mass of material recounting gallant actions which defy adequate description without dulling the edge of the attention of the reader.

With all these matters, and many more, I have attempted to deal. At times such descriptions may appear heavy and technical; these the lay reader must skip. But I hope all who can do so will read the account of the work of the Patrol first-hand and for themselves, and not trust to bare and often superficial comments. They owe the few hours so expended to the men numbering several thousand who laboured so hard and so well for their country during the war.

I point out subsequently in these volumes that attempts were made by the Operations and Barrage Committees formed at the Admiralty towards the close of 1917 to interfere with the tactics of the Dover Patrol. Lord French has struck with amazement the entire thinking population of the world

¹ The following incident may serve to show how fully I was obsessed with the necessity of obtaining mines for dealing with submarines at the end of 1916. When Sir John Jellicoe was appointed to the Admiralty at that time, Rear-Admiral Duff came with him as Head of the Anti-submarine Department. I visited the room of the latter to congratulate him on his appointment and greeted him—he had only been in the office one or two days—with “What is your cap doing hanging up on that peg?” “Why shouldn’t it be there?” “It ought to be on your head and you should be at the Ministry of Munitions arranging for sufficient machines being immediately allocated to make a million horns for mines,” was my reply.

by divulging how efforts were made by the Government at home, or at least by some members of it, to dictate to him the strategy he should adopt, and also how British troops—those employed at Ostend, and therefore in the same theatre of operations as that in which he commanded—were placed outside his control. But in their maddest moments no one, either in the Cabinet or War Office, tried to dictate to him his tactics. What can, therefore, be said of the Admiralty setting up a system of irresponsible committees to devise operations, to arrange details of operations, and to plan the laying of defensive and offensive barriers within the area of the command of an Admiral who alone knew the local conditions?

The First Lord¹ appointed a Barrage Committee to enquire into the Dover Barrage in 1917. I was not even represented on it. But this body, in its report to the Admiralty, was forced to agree with all I had done and proposed to do as regards the Folkestone-Grisnez mine barrage. It recommended, however, that the barrage should be placed under one officer responsible to the Admiralty only! This meant that, in the middle of the waters I had to regulate and protect—a business that these reminiscences will show was one of the greatest complexity—an *imperium in imperio* was to be established under Admiralty control. This separate command was to control mines, some hundreds of patrolling vessels, and possibly, obstructions, while I was to remain responsible for the safety of traffic. These mines, patrol vessels and obstructions would probably have been subjected to direct attack by the enemy. This separate command and its very existence were necessarily closely linked with every portion of my command from Zeebrugge to the Downs, from Boulogne to Beachy Head. Yet officers capable of framing such a suggestion were sent to report on the Dover barrage! Needless to say, when the President of that Committee was appointed almost immediately afterwards to super-

¹ Sir Eric Geddes, who, until the war, was Assistant-General Manager of the North-Eastern Railway.

sede me in the Dover Command nothing more was heard of such lunacy.

Again, while preparing the Zeebrugge-Ostend blocking plans, a scheme was sent to me drawn up by the Operations Committee of the Admiralty who had never seen the Belgian coast except on a map. It was a childish proposal. How this was returned to the Admiralty, accompanied by my opinion of the endeavours of that Committee, will be told later. One Admiralty Committee that was most helpful and efficient, and which never meddled with executive functions, was the Anti-submarine Committee under Rear-Admiral—now Vice-Admiral Sir—A. L. Duff and Captain W. W. Fisher. The country and the Navy owe a debt to the whole-hearted and disinterested labours of this informed, resourceful and experienced Committee, which owed its existence to Lord Jellicoe.

During my time in command at Dover I had the privilege of being associated with Mr. Churchill, Mr. Arthur Balfour, and Sir Edward Carson as First Lords of the Admiralty. I cannot refrain from expressing my gratitude for the kindly and unfailing support they extended to me during their periods of office, especially during 1916 and the early part of 1917 when my work was full of difficulty. It was of great assistance in carrying out the onerous duties entailed by the command at Dover to feel that, in all I did, I had the approval of the heads of the Navy, men who were experienced in dealing with men and the public service. At the same time I had the immense advantage of working with Lord Fisher, Sir Henry Jackson and Lord Jellicoe as First Sea Lords in succession; each in his own sphere is unrivalled by any officer in the Navy. Cordiality is a cold term to apply to our relations. In connection with any criticism that may later appear of the Admiralty, I particularly desire to emphasise one fact, namely, that these three First Sea Lords and the respective First Lords, under whom they acted, always gave me the fullest support. I

know well the difficulty of Lord Jellicoe's position, and how, in spite of strong and adverse pressure, he supported me towards the close of 1917 with the loyalty which it is the right of one in command at sea to expect from a First Sea Lord, and which is as necessary in war as the loyalty which the junior owes to his superior in office. One day probably the country will assess this great officer's services at their true worth.

Everything I had in my mind was known to the First Sea Lord of the time, and I, in turn, knew all he thought and desired so far as the Dover Patrol was concerned. I can imagine no more ideal relations between the First Sea Lord and an Admiral in command than those which existed between the three successive occupants of that office and the Admiral at Dover. Perhaps the greater difficulties of the period when Lord Jellicoe was First Sea Lord lead me to emphasise my debt to him for the support and the assistance which he, with his varied and ripe experience in all sea matters, afforded me with generous freedom.

In Admiral of the Fleet Sir Arthur Wilson, who was doing special duty at the Admiralty, I had a most constant and valuable friend, whose knowledge and shrewd judgment were unrivalled, and to whom I was indebted for much wise counsel. Rarely did I visit the Admiralty without seeing him and having the benefit of his views on any matters that might be on hand.

Sir Henry Oliver, the Chief of the Naval Staff, was another sound adviser. I would much like to sketch briefly his services to the nation, but it is merely for me here to acknowledge my personal debt for his valuable aid. Many others at the Admiralty were most helpful; as, for instance, the successive Directors of Naval Ordnance, Captain P. W. Dumas, Assistant Director of Torpedoes, and the late Mr. M. M. Waller, Director of Stores, who died as truly in the service of his country as if he had been killed in action.

Those outside the Admiralty to whom the Dover Patrol was indebted were many, but first and foremost is the late

Rear-Admiral the Hon. Horace Hood, who first organised the Patrol. I have been able to give a short account of his splendid work during the German advance on the Belgian coast from information supplied by Lieutenant-Commander T. B. Adams, R.N.R., who at that time was his flag lieutenant. The Patrol never forgot its first Admiral, and no subsequent events ever dimmed the pride of those who were privileged to have served under him.

Admiral of the Fleet Sir George Callaghan, Commander-in-Chief at the Nore, was always indefatigable in rendering the Patrol all the assistance in his power.

No account of the Dover Patrol would be complete without reference to the invaluable help received from Commodore (afterwards Rear-Admiral Sir) Reginald Tyrwhitt and his destroyers at Harwich. This officer, well known now to the country, was always in the forefront of every fight if he could possibly get there, and, if this were impossible, he was always trying to be there. Several of his divisions of boats worked at times with the Patrol and gave support which we much needed.

I deal later with the gallant officers commanding the French naval forces of the Patrol. Always before the war I was apt to imagine, from historical writings, that allied co-operation was a will-o'-the-wisp. I found the co-operation of those Allied officers as cordial and whole-hearted as that of our own senior officers, their one and only desire being to assist in every way that was possible.

To Field-Marshal Lord French and Field-Marshal Lord Haig the thanks of the Patrol are due for the consideration they invariably showed and the care with which all proposals were weighed by them. I would also add my personal thanks for their assistance and hospitality during their periods of command.

My association with General Lord Rawlinson and his Staff during the planning of the proposed Great Landing on the Belgian coast have left me many pleasant memories.

It is a thousand pities that that project had to be abandoned, for under so accomplished a leader it was bound to succeed.

Again, my work with General Sir Aylmer Hunter Weston was of the greatest benefit to us in the Patrol ; we learnt much from the experience of that gallant officer.

My third reason for writing this book is that after my brutal—brutal is the only adequate term I can think of to apply—dismissal from Dover, the Admiralty, through their official head, took no steps to contradict statements in the Press as to my work, both past and present, and the operations I had planned for the future, though they knew those statements to be untrue.

So long as silence is imposed, and most properly imposed, on officers and men during a war, so long is it incumbent and obligatory on the First Lord of the Admiralty to defend the professional honour of the personnel when publicly attacked. This duty was in my case totally disregarded, and, therefore it is necessary for me to state the facts, which, without in the least compromising secrecy, might and should have been done by the Admiralty earlier. It is this kind of treatment of officers that shakes to its very foundations the confidence of the Navy in its rulers. Personally I have nothing to gain or lose ; but the traditions of the Navy are a national heritage, and any First Lord who impairs those traditions does a disservice to the State.

Let the country remember that in war-time the Cabinet and the Admiralty are all-powerful and beyond criticism by any person on active service who has real knowledge of their doings. An autocracy is temporarily conferred on them owing to the exigencies of war. One check on the proper use of those autocratic powers is the knowledge that after the war the lips of their subordinates will be unsealed and they will have to account for the use of those powers during their stewardship. It will be astonishing if many post-war publications do not emphasise the salutary nature of this check on official action.

“Oh that mine enemy would write a book!” is a prayer in which there is a good deal of hidden meaning, especially in these days when we find critics with no mandate but their own assurance telling the British public what an Admiral should or should not have done. Was there ever a greater absurdity than the kind of criticism which was indulged in, for instance, after the battle of Jutland? The Commander-in-Chief with the whole responsibility for the safety of the country and the Empire on his shoulders, with the unknown and unascertained possibilities of the outcome of a modern fleet action ever present, with the chances attending torpedo attack not clearly proved or disproved, with the difficulties of the moment imposed by reports conflicting in essential details as to the number and the position of the enemy, with a puzzling light and atmospheric conditions that defied clear vision—under these conditions an officer of greater experience than that possessed by any one in our Navy had to decide whether to deploy on his port or starboard wing division. His decision, which had to be made in a few seconds, was the integration of a hundred factors and the humble naval officer, with many years of experience behind him, would be content to accept his action as that which at the time experience dictated as being the best—not the most flashy, not the most gambling, not the Nelsonic, in the modern and false interpretation of the term, but the Nelsonic in the sense of sound purpose to attain the desired end. But critics, knowing neither responsibility nor command, mists or sea-fog, who have not even skirted the fringe of real knowledge of diverse sea weapons, have had the assurance to pass judgment and tell the country he was wrong, and that he ought to have done the other thing. I am writing for the person who desires his information at first-hand, not for those who are guided in expert matters by non-expert writers, in sure knowledge that what I write will long survive the comments of such critics.

In view of the possibility of future wars, a little plain speaking may not be out of place. If the country is to get the

best from its Admirals and Generals, it should see that they are treated with at least as much consideration as is usually accorded to domestic servants. A section of the Press, with inaccurate knowledge, criticised in ignorance and abused with venom, officers in responsible appointments and commands. A First Lord, handicapped by possessing neither political nor departmental experience, was set over a Service of peculiar traditions and sentiments ; for, as the sea differs from the land, so the ruling of sea officers differs from that of railway servants. Suddenly to supersede a First Sea Lord and instal in his office his assistant is without precedent in Admiralty records. It was a bad precedent, and if repeated one liable to breed lamentable distrust between officers in the future.

My own case was peculiar. Exactly a fortnight before the day on which the First Lord informed me of my supersession, he expressed to me his sense of the great work I had done at Dover and the hope that nothing would ever cause a break in the relations existing between the Admiralty and myself. A fortnight ! Things moved quickly about the end of 1917. With the first submarine caught in the Folkestone-Grisnez mine barrage and with the Zeebrugge attack fixed for February 22nd, 1918, there was no time to lose.

The Admiralty have a perfect right to make any changes they may wish ; there may be a variety of underlying reasons for, as also diversity of methods of, carrying out the changes. The past, as far as current events are concerned, matters not now. Fortunately the Navy had no new work to do in 1918, so the Admiralty had only to sit tight and reap the credit of the results of the work of the previous years. The constitution of the Admiralty therefore fortunately mattered little. But the effect of past happenings on the future is indelible ; distrust has been sown and bad precedents created. Officers who may command in future wars will enter on their duties with the record before them of how the highest officers were abused in public without cause, and without check or protest from

those in authority. This will cause a feeling of insecurity, bred of the knowledge that, while they are fighting and bearing heavy responsibilities, calumny on shore may be undermining their reputations.

Let me explain a little more fully what I mean by protecting the professional honour of officers. I will quote one case, out of many. In a much-advertised publication which appeared in 1918 it was stated :

“ It was not until Sir Roger Keyes was appointed to the Dover Command and a new atmosphere was created that remarkable departures in new policy were inaugurated. This policy took two forms. First, there was the establishment of a mine barrage from coast to coast across the Channel, and, simultaneously with this, North Sea minefields stretching one from Norwegian territorial waters almost to the Scottish foreshore, and another in the Kattegat, to intercept such German U-boats as base their activities upon the enemy’s Baltic force.”

That statement the Admiralty knew to be absolutely untrue. They were aware that Lord Jellicoe had planned the North Sea minefield, and ordered the mines ; they were also aware that plans had been made by me and approved by Lord Jellicoe for the mine barrage in the English Channel, *which I had nearly completed before I left*, and for an attack on Zeebrugge and Ostend which was to take place, if possible, at the end of February 1918. Yet knowing that the lips of both of us were practically sealed until peace was declared, those statements were never contradicted. They allowed the country to believe that the new administration at Whitehall and the new Admiral in command at Dover were responsible for devising the schemes and that those who went before lacked initiative. One would have thought that in a matter where they undeservedly reaped prestige through an untrue statement published broadcast, and freely commented upon, they would have insisted on contradiction being

made. Lack of contradiction was bound to cause the public to believe that the Admiralty assented to these and similar statements ; since few men or women in this country could believe that a British Admiralty could have remained silent under such conditions. Convenient opportunities for stating the truth were not wanting, for weekly meetings were held with the representatives of the leading London newspapers. Surely corrections of mis-statements damaging to the contemporary reputations of officers of long service might well have been included in the programme of propaganda.

Perhaps it would have been both difficult and inconvenient to have to explain to the country why officers capable of originating and undertaking schemes of such great magnitude and possibilities should have been summarily dismissed from their appointments and commands.

No one but a First Lord trusted by the Navy and experienced in public affairs, can give the support that officers in command require in war. It is to be hoped that this will not be overlooked when once again that service on which "our safety, honour and welfare chiefly depend" is called upon to defend the country.

I have quoted freely from the Ballads of the Dover Patrol. I am advised such a proceeding is unwise, as the British public regard verse as poetry, and poets are apt to be looked on as unpractical. I plead that the verses have no merit except perhaps that of reflecting more of the spirit of the Dover Patrol than the prose of an unpractised pen can convey.

In conclusion, I must thank all who have helped me in the compilation of these records, and more especially Vice-Admiral Ronarc'h, of the French Navy, Captain Frederic Bird, C.M.G., D.S.O., R.N., Brigadier-General C. L. Lambe, C.B., D.S.O., Captain Vansittart Howard, D.S.O., R.N., Captain G. N. Tomlin, M.V.O., R.N., Captain Blake, R.N., Marine Superintendent, South-Eastern Railway, Commander J. S. G. Fraser, D.S.O., for helping me with the charts, Commander Hamilton Benn, M.P., C.B., D.S.O., R.N.V.R., Lieutenant-

PREFACE

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CHAPTER I

HISTORICAL

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THE magnificent harbour completed at the commencement of this century raised Dover to a naval base of first-class magnitude. The peculiar development of the strategical position during the late war gave to the Straits of Dover and the extreme southern part of the North Sea their old importance once more, and Dover obtained the right to associate its name with the forces employed in these waters.

Though the name of Dover is linked with no outstanding episode in our naval history, of fourteen of the most important battles fought by the British Navy, we find the area of the Dover Patrol the scene of six: the battles of Hubert de Burgh¹

¹ Hubert de Burgh defeated in 1217 Eustace the Monk, who tried to pass reinforcements across the Channel: "If these people land, England is lost. Let us therefore boldly meet them," declared de Burgh. It has been said that no more admirably planned and no more fruitful battle has been fought by Englishmen on water.

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and Sluys,¹ the defeat of the Armada,² the Four Days Battle,³ the fight off the North Foreland,⁴ and, later, the battle of Beachy Head.⁵ This is a finer record than any other sea area can boast of.

Why, it may be asked, has the area of the Dover Patrol been conspicuously linked with so many naval battles? The answer is a simple one. The Straits of Dover have always constituted the bottle-neck of the food supply of London, and the main route of its oversea commerce, as well as being the narrowest part of the belt of water protecting this country from invasion. It was, therefore, bound to be of first-class importance in a war in which France, Holland, or Belgium was our antagonist, and in the autumn of 1914 the appearance of the Germans on the Belgian coast immediately raised the Straits of Dover and the waters of the north coast of France to a foremost place in the conflict.

Dover Castle throughout English history has been associated with internal troubles and has a great military record, but since the time of the Norman Conquest, Dover, so far as invasion is concerned, has been untroubled. The cliffs of Dover, crowned by the Castle, have always stood as a passive symbol of solidity and national security. Like most popular hero-worship, the esteem in which these cliffs are held is entirely

¹ On June 24th, 1340, off Zeebrugge, Edward III gained a victory over the French. Two hundred and thirty French ships were taken and two Admirals and several thousand Frenchmen were killed. Our losses were insignificant.

² The Armada of 1588 was finally dispersed off Dover and the shoals of the Belgian coast.

³ In the Four Days Battle (July 11th-14th, 1666), between Monk and de Ruyter, eighty English and one hundred Dutch ships were engaged. This was one of the most remarkable actions fought at sea, the Dutch losing three Vice-Admirals, 2,000 men and four ships. The English loss was 5,000 killed, 3,000 prisoners, and seventeen ships.

⁴ Off the North Foreland on August 4th, 1666, the Dutch were completely defeated by Monk. The English fleet followed the Dutch, entered one of their ports, and destroyed a large fleet of shipping.

⁵ At the battle of Beachy Head, July 10th, 1690, seventy French ships engaged fifty-six English and Dutch, the French winning the victory.

undeserved. The cliffs of Dover switched Julius Cæsar in his second and successful landing to the eastward to Deal and William the Norman to the westward—to the lower lands of the Romney Marshes ; they never stopped invasion. The cliffs were valuable only in defending themselves, and even then afforded only temporary self-preservation, for, like all fortresses, Dover Castle capitulated as soon as the neighbouring country, less protected by nature, fell into the enemy's hands. The cliffs of Dover are rather like those popular people who, looking impressive, and talking in fine phrases, do nothing, and get all the credit !

The credit for the security of England lies with the waters of the Channel and its tides, but in the popular mind the sea is often forgotten and the land takes the praise. The Channel, that invaluable twenty by twenty miles of water, is worth 5,000,000 cliffs of Dover. English men and women are rarely enthusiastic about the Channel ; it is to them a cause of woe in peace-time, when wishing to pass to the Continent, but it has, nevertheless, always been our best friend in war-time. It defends us, and we have to assist it in the defence ; it is both a moat to our island stronghold and the highway of our life-supplying commerce.

In the late war these waters became a frontier, being the nearest frontier to the enemy. The importance of the locality rose to the level it held in the early part of last century, but its natural defensive attributes were much weakened, and had waxed relatively feeble owing to the progress of mechanical science. There is something sad in the thought of the old Channel, once so strong, having its natural strength impaired by modern inventions—its tactical width and the strength of its tides reduced in value by the speed of the intruding vessels and the increased range of their guns. Destroyers, submarines, and high-speed vessels heeded less the old moat than did ships dependent on wind and tide. The active forces of defence in the late war, therefore, grew out of all proportion to those which previously had been

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known in its waters. It is this progress, this reinforcement of our old natural defence—the Channel—as well as the extended offence exercised by the Dover force, that render the story of the Dover Patrol in the war so arresting and important.

It was necessary to close the Straits to the German vessels based on the Belgian ports, and to offer adequate protection, on the flank, to the stream of transports and storeships passing to and from France, where our army was fighting against heavy odds, while at the same time keeping the Channel-way open for the immense volume of shipping carrying food and other necessaries to London and the important ports on the East Coast. In short, we had to close the Straits to the enemy, frustrating any attempt at invasion, and continue to use them ourselves. Those were the varied tasks which were thrown on the force at Dover, with a secondary base which was formed at Dunkirk.

The history of the southern waters of the North Sea which formed an important portion of the Dover Patrol would require a volume of its own, but for our purpose it will be sufficient to deal with two epochs only when this area came prominently into notice under conditions somewhat similar to those which obtained during the late war. The first of these is roughly between 1671 and 1697, when Jean Bart, the famous French commerce raider, made Dunkirk his headquarters, and the second when Lord Nelson commanded the light forces in what became in the late war practically the Dover Patrol area.

In 1671 Jean Bart, when twenty-one years of age, joined the French sea forces at the time when Louis XIV and Charles II had formed an alliance against the Dutch. His raids on Dutch commerce during the three succeeding years were so fruitful that he, at his own expense, fitted out in 1675 a sloop carrying two guns and thirty-six men, and at once captured a Dutch frigate mounting eighteen guns and carrying sixty-five men. He continued to take prizes and, joining

with other men of like spirit, fitted out a 10-gun ship and captured a Dutch 12-gun ship. He then was given command of five frigates, and on March 23rd, 1676, captured an 18-gun Dutchman. Shortly afterwards he met eight merchant ships from London, escorted by three ships of war, captured one of the escort, drove the others off, and took the merchantmen into Dunkirk. In May 1677 he captured a frigate and sixteen merchantmen. In September of the same year he captured the *Neptune*, 36-gun frigate, and her convoy. In the years mentioned he secured forty-nine vessels!

In 1688 he commanded a 24-gun frigate and took a Dutch privateer. In 1688 France was at war with England and he met two 50-gun British ships and was taken prisoner. Almost immediately afterwards he escaped from Plymouth, and in a pulling-boat landed near St. Malo after rowing for two and-a-half days in the Channel, although still suffering from a wound!

In 1690 Jean Bart was given command of a frigate and fought under the Count de Tourville at the battle of Beachy Head. His next task was to escort two valuable ships from Hamburg to Dunkirk, and, while waiting for them to be ready for sea, he cruised in the North Sea and ransomed vessels to the amount of 45,000 crowns. He then took his convoy safely to Dunkirk. In 1691 he was blockaded in Dunkirk, but persuaded the King of France to let him fit out some small vessels. He slipped out at night, opening fire on the blockading squadron as he passed. He captured the following evening two English ships, one carrying fifty, and the other forty guns, as well as some merchantmen. These he took to Bergen. He then seized two 40-gun Dutch ships escorting a large fishing fleet, burning most of the vessels and landing their crews on the English coast. Later on he captured and burned a Dutch 36-gun frigate and made many more prizes.

Next he raided Scotland, plundering and setting fire to villages. He was nearly taken a prisoner by treachery on

board an English ship at Bergen, but he turned the tables on the captain and crew by standing over a powder-cask and threatening to blow the ship up. The arrival of his own men enabled him to capture the vessel.

He then returned to Dunkirk and went to Paris, where he at once made himself notorious by smoking his pipe in the ante-room while waiting for an audience with the King. On King Louis asking him how he managed to break the blockade at Dunkirk, he arranged the courtiers present in a line and went for them with his fists, knocking them down, as a practical demonstration. Again blockaded in Dunkirk in October 1693, he successfully broke out, and at once captured four British vessels and carried them to France. Subsequently he captured seven out of a fleet of eighty English merchant-ships and took the crews on board his own ship.

He then raided the English coast near Newcastle, and came back from his cruise with spoil calculated at 500,000 crowns. Again setting out from Dunkirk with three frigates, he captured more merchant vessels. Before returning, he fell in with three men-of-war escorting a convoy and, with the aid of two other frigates, captured two of the men-of-war. After boarding the 54-gun ship three times, he was beaten back and she escaped, leaving to him the merchant convoy. He missed capturing the Prince of Orange on his way to England through the small squadron lowering their flags to him. Not knowing of the presence of the Prince, he let the ships pass.

Next he captured a Dutch fleet laden with corn and other goods, which was being convoyed by one 48-gun ship, one vessel of forty guns, and another of thirty-six guns. He captured the largest, the other two made off, and he got eighteen merchantmen. Again in May 1694 he was blockaded in Dunkirk, but, as there was a much-needed corn fleet for the supply of bread to France in the north ready to sail, he again broke out. This time he employed the ruse of sending small vessels to show lights and attract the attention of

the blockading fleet in one direction along the coast while he and his ships slipped past the other end of the blockade line. The Dutch meanwhile had fitted out a fleet of eight ships to intercept the corn ships. This they did, but Jean Bart, knowing the importance of this fleet to France, exclaimed, "We must bring them to action: the interests of France call upon us." He met them and went straight for the Admiral's ship, boarded and took her. His other vessels captured two more of the fleet and the remaining five made off. He retook all the corn vessels. This capture led to corn in France falling from 40 livres to 3 livres per bushel.

Afterwards Jean Bart, with six line-of-battle ships, took the Prince de Conti from Dunkirk to Denmark *en route* to Poland. He had to break past a squadron of nineteen of the enemy. When clear of danger, the Prince asked Jean Bart if he had not been afraid that the enemy might have captured them. Much to the Prince's horror, Jean Bart informed him that not the slightest danger of such a contingency had existed, as his son had been stationed with a match in the magazine to blow the ship up on receiving a prearranged signal. This was his last exploit in the North Sea.

The above rapid sketch gives an idea of what a determined seaman did in waters traversed by hostile trade, even with great odds against him. The objectives available to Jean Bart were no more numerous than, in fact not so numerous or valuable as, those open to the Germans when in possession of the Belgian coast. Our shipping and that of the French during the four years and more of the war must have far exceeded in number that of the English and Dutch at the end of the seventeenth century. Jean Bart was the embodiment of the sea instinct and sea genius of a raider. The way he stirred up the waters of the North Sea with the small force at his disposal might well have formed an object lesson to the Germans on the Belgian coast. If they had carefully studied naval history they could, had they seized their opportunity, have done infinitely more damage to England than Jean Bart was able

to effect. But that is a matter that will be dealt with later.

The other epoch to be studied is that when England, in 1801, was threatened by Napoleon Buonaparte with invasion, and Lord Nelson, fresh from the Baltic and Copenhagen, was appointed to command the eastern Channel and the waters from the Thames to the Scheldt. This command only differed from that of the Dover Patrol in that the entrance of the Thames as far as Orfordness on the Suffolk coast came under Nelson's orders. The northern limit of this command was roughly a line from Orfordness to West Capelle on the north shore of the Scheldt, and that of the Dover Patrol during the late war was a line from the North Foreland to the same point on the Dutch coast.

Lord Nelson was only in active command from July 27th till October 22nd, when peace preliminaries were signed. His flag, however, was not struck till April 10th, 1802.

The work of the command was similar to that of the Dover Patrol in that it was chiefly concerned in preventing small vessels or boats landing troops in England, and in protecting our commerce. The problem of landing in England from Calais and Boulogne was far more difficult to the French in 1801 than landing on the French coast from Ostend was to the Germans in 1916. The possibilities of a landing force starting from the Flanders ports for England were the same then as now, except that Flushing and Dunkirk were added to the possible ports of departure.

It may be interesting to make a rough comparison between the conditions imposed by sail and the short-range gun and steam and the long-range gun, as affecting the problems of the Dover Patrol separated by a century of time. Submarines had no counterpart at the opening of the nineteenth century, neither were there any vessels for raiding purposes comparable to modern destroyers. These two classes of vessels, so far as commerce attack and protection were concerned, represented a development entirely to our disadvantage—that

is, a disadvantage to the defensive side. The commerce of England in 1801 had merely to keep to the English side of the Channel to be more or less immune from attack, since, with ships at Beachy Head, Dungeness and the Downs, a raider should have had little chance, whatever the wind might be, of again making a French port without being laid aboard. Moreover, our vessels could be, and were, kept in the offing of the French ports quite free of danger from attack. They exercised a wholesome check on the vessels of comparatively small size that could issue from those ports. The chief fear of attack on shipping (as shown by Nelson's letter to Captain Ferrier of H.M.S. *York*) was by rowing-boats and small craft putting out from the French ports in fogs.

So far as landing was concerned, fine weather and a fair wind were required. A concentration of ships at Dungeness or the Downs was sufficient to deal with this threat. On August 3rd Nelson wrote to Admiral Skeffington about the French flat boats for transporting troops: "Of the craft that I have seen I do not think it possible to row them to England, and sail they cannot." On another occasion he gave them half a knot speed.

The long-range gun is all in favour of the shore battery with a steady platform on account of its small vulnerable area and better range-finding possibilities as compared with a ship.

Steam brought with it possibilities of rapid movement unknown in the days of sailing vessels. The torpedo at night made inshore blockade impossible where before, except in gales on shore, it was practicable to apply the blockade. Even in these conditions no vessel was caught by Nelson's Flanders blockade, although twice vessels escaped from Flushing and Dunkirk. Even then inshore blockade was unreliable.

Steam is all in favour of the raider, either for commerce destruction or attacks on shipping. The fundamental cycles of dark and light remain constant. The longer the distance he can annihilate at night, the greater the advantage to the

seaman with the initiative. In the late war, steam, the torpedo, and the submarine intensified one hundredfold the difficulties of the Dover Command as compared with what they were in Nelson's time.

Nelson's first offensive was to bombard Boulogne, on which occasion he sank about five of the flat boats. Evidently he was convinced that bombardment was not a very satisfactory way of getting at the craft, as he dismissed the operation in a letter to the Admiralty by saying that "The whole business is of no further moment than to show the enemy that with impunity they cannot come outside their ports." He subsequently remarked that "The enemy can be more annoyed by firing into their harbour at night than by greater and larger attacks." The possibility of an attack on Calais was mentioned in a letter to Lord St. Vincent: "I believe Calais could be bombarded, but do you think it an object?"

About the same time his attention was fixed on the possibility of an attack on the vessels in Flushing. After going over to West Capelle with a view to seeing Captain Owen, his remarks are interesting: "Captain Owen is close to us: I shall know Captain Owen's ideas. His zeal, I am afraid, has made him overleap sandbanks and tides and laid him on board the enemy; but I must clear away these little obstacles before I can give him scope for intentions. I admire his desire, and could join most heartily in it, but we cannot do impossibilities, and I am as little used to find out the impossible as most folk; but I think I can discriminate between the impracticable and the fair prospect of success." These were the words of Nelson, the embodiment of British sea-power employed offensively. His ultimate conclusion was that Flushing was outside possible attack.

A second attack was carried out on Boulogne on August 15th. This time a cutting-out expedition was planned, but failed from three causes. The boats in the harbour were moored to the bottom as well as to each other with chains which defied cutting. The infantry ashore brought a heavy fire

to bear on the boats after they had been boarded and the French crews had left. The attack was not sufficiently synchronised. Nelson assigned, as the main cause of failure, the dark night and the tide. This was his last offensive operation. He planned one more, that of sending a fire-ship into Boulogne, but peace preliminaries prevented this materialising.

As a matter of fact, so far as can be gleaned from his published despatches, Nelson was out of his element in a service of this nature. So long as there was a chance of the enemy coming out and being fought at sea or of his carrying out some important operation, he was eager and full of fire. But when confronted with the difficulties and disappointments inherent in inshore work, and called upon to exhibit the patience required to carry on such tiresome and exacting operations, he appears to have lost interest. Writing to Alexander Davidson even on August 31st—only one month after taking up the Command—he says : “ I agree with you and all my friends that this is not a service for me beyond the moment of alarm ; but I am used and abused.” He certainly was abused later on ! His failure at Boulogne brought abuse—a common fate even in the late war. As regards a critic called Hill, who attempted to blackmail him, he writes : “ I wish the wretch had been caught as an example, not but that I am indifferent to all they say against me, because I know I have always done my duty to the best of my ability.” Many others can say the same. And in a letter of September 14th, 1801, he remarks : “ The people at the watering-places have been very free in their conversations, and I believe the Mayor of Deal either put a vagabond in prison, or sent him out of town, for arraigning my conduct in being careless of poor seamen’s lives. But I trouble not my head on these matters ; my conscience tells me that I do my best. You will easily believe that I should have liked to have tried the business at Goree, but the objections to it were unnumerable. You would have Dickson and all of us, *the service*. If success

attended it, it would be said, ‘Aye, the Admiralty gave from partiality this to their favourite (for I do flatter myself I am a favourite). If it miscarried, then it would be said, ‘That vain man, Nelson, thought he could do what no one else could, and his friends at the Admiralty had folly enough to believe his impossible schemes. . . .’ That wardrooms will prate, I believe none of us can doubt, and it has its bad effects. The boat service I believe is got very unpopular. G—— flogged some of his chaps severely for some very improper expressions. They belonged to the *Unité*, who was, I fancy, in very bad order.”

One or two other extracts from his letters at this period are interesting as showing how in 1801 the same underlying principles persisted as in 1916, though the material was different. On September 4th he writes :

“ In fine weather our squadrons go and show themselves, but never risk being crippled or driven into the North Sea. Thus we shall be sure of an effective force ready to act whenever occasion calls for it ; and with the large force their Lordships have appointed for the protection of our coasts, if it is kept in order, I do not see how the enemy can with impunity put into the Channel.”

He therefore had come to the conclusion that husbanding his force was the right course to pursue. Our experience was the same. Again, as regards his relations with the First Lord of the Admiralty he writes :

“ Your kind letter I received half an hour before the attack ; but, my dear Lord, although I disapprove of unnecessary consultations as much as any man, yet, being close to the Admiralty, I should not feel myself justified in risking our ships through the channels of Flushing without buoys and pilots, without a consultation of such men as your Lordship, and also I believe you would think an order absolutely necessary.”

This is the real and ideal procedure. It is interesting to

speculate how he would have viewed an Operations Committee at the Admiralty interfering with his command!

Again, he values experience bred of locality when on September 4th he writes : "But I submit my opinion with deference, never having been used to the service of the North Sea and this part of the Channel." On October 6th, just before giving up command, we find : "One happiness under my command, that not one English boat has been captured by the enemy during the time of my command within the limits of the station."

It is interesting to note the restless zeal at the commencement of his command, before he knew the difficulties—hurrying bombing vessels to Boulogne, and writing to the senior officer off Dunkirk to know if he could attack the vessels there the *next night*. He projected an attack on Flushing, but after only three months, having learned the hard facts of inshore work, his great comfort on giving up the command, the one real material item achieved, was that he had protected the English shipping so that none had been lost.

Had Jean Bart been pitted against Nelson, both would probably have had different tales to tell. One hundred years elapsed between Jean Bart and Nelson, and one hundred years between Nelson and the late war, but the lessons to be gleaned are the same, tempered only by evolutionary changes in material.

The chief local alteration that took place between 1801 and the late war was the building of the enclosed harbour at Dover. Dover Harbour was commenced in the reign of Henry VII. Great improvements were planned by Henry VIII, but unfortunately the mole he built merely trapped shingle and did more harm than good. Queen Elizabeth took the matter in hand, and in 1582 appointed a commission to investigate the subject. Sir Thomas Scott put forward proposals to make a pent, the waters of which at low tides could be released so as to scour out the shingle. This scheme,

after certain modifications had been carried out, was successful, but eventually, being neglected, the pent fell into a bad condition in Charles II's reign. Many other projects were tried, but it was not till 1850, when the Admiralty Pier was completed, that a really good protection was afforded. In 1897, the year before the passing of the first German Navy Act, the Admiralty decided to build an enclosed harbour. In 1907 the work was completed and formally opened by King George V, then Prince of Wales. It was a fortunate thing that, seventeen years before the war, this project was undertaken!

The present enclosed harbour was intended to accommodate battleships as well as destroyers and submarines. The currents at the entrances at certain states of the tide, however, were found to be dangerous. At the same time our probable sea antagonist changed from France to Germany, and the British battle squadrons were gradually based farther and farther north. The occupation of the Belgian coast by Germany never entered into the ordinary forecast of a war with that country ; our eyes, even when war seemed possible, were focussed on the Elbe and not on Ostend or Zeebrugge. Dover was not considered a base of particular importance.

The Dover Flotilla, therefore, at the outbreak of war formed part of the East Coast command under Rear-Admiral George A. Ballard, who had made Harwich his headquarters in accordance with the Admiralty's plans. Its chief function was to prevent German ships breaking through and going down Channel, and at the opening of the war a fleet of pre-Dreadnought ships patrolled the Channel farther to the westward. All German homeward bound ships had to be intercepted by the Dover flotilla, and neutrals examined to see that they did not carry contraband of war. Consequently all vessels of every sort, British or neutral, were made to anchor in the Downs, and were here examined while at anchor ; in order to prevent any ships slipping through the wide waters between the Goodwins and the French coast a

large minefield was laid closing all this water, except a channel close to the French coast from Calais to Dunkirk.¹

It, however, soon became apparent that Dover and the Narrows of the Channel were destined to become of greater importance than the remainder of the East Coast. The rapid advance of the enemy on Paris, with the consequent capture of a large portion of Belgium and the necessity for keeping open communications with our increasing army in France, and stopping submarines, if possible, from passing down to interfere with our transports and storeships, all pointed to the strategical importance of the Dover area. It was, therefore, made a separate command under Rear-Admiral the Honourable Horace Hood, a very able and gallant officer who lost his life subsequently in leading a division of battle-cruisers at the battle of Jutland.

Drifters to drift nets to catch and entangle submarines, and trawlers to sweep for mines and regulate traffic, were added to the command. An efficient examination service was started at Ramsgate, with a liberal complement of armed boarding steamers. A small fleet of armed drifters was also supplied for the defence of the Downs against submarines.

During this period the restricted forces of the Dover Patrol operated with good effect against the enemy and assisted the Army with such gunfire as the vessels were able to bring to bear. Although the operations under Admiral Hood do not fall within the scope of this history, they were of such importance, and had so marked an influence on the subsequent situation on the coast, that they demand more than cursory treatment. An account of the work done by the Dover Patrol at this period, in circumstances of considerable difficulty, is, therefore, given in an appendix.²

There is little doubt that the presence of the flotilla under Admiral Hood assisted powerfully in checking the enemy's movement along the coast with the intention of seizing the

¹ The mines used at this time were far from being effective.

² *Vide* Appendix I.

Channel ports. The Germans had made elaborate preparations for this offensive. Everything, as they thought, had been prepared for, and every possibility foreseen; the fire from the naval guns was unsuspected, and the arrangements for the enemy's transport had suddenly to be remodelled.

In this connection I am tempted to quote a statement written at the time by a competent eye-witness who was fully aware of the views of Rear-Admiral Hood, because his words confirm my own views and those of every one qualified to express an opinion.

"Although in the early days of the operations the ships were able to check the advance, it is not to be believed that ships alone are ever able to defeat guns mounted on shore. As long as the enemy tried to advance along the coast, so long was the flotilla efficient for masses of troops in motion, and guns and wagons *en route* are good objects. As soon as the advance was checked, so soon was the enemy able, by mounting heavy guns in permanent well-concealed positions, to check the flotilla. When the enemy no longer advanced there were no more masses of troops or of transport to form a good target.

"But it must be remembered that the checking of the advance was the object of the presence of the ships; when the rush of the enemy along the coast was stopped the ships had done their work, and after that all that they could possibly do was to prevent its recurrence or to move forward if the Allies decided to take the offensive along the coast.

"So much misunderstanding exists on the subject of the capabilities of ships' guns against forts on shore, that it cannot be too strongly insisted that ships' guns unassisted by advancing troops are almost useless to destroy guns suitably mounted ashore."

Soon the enemy appeared on the coast, Zeebrugge and Ostend were taken, and the advance still crept westward until the gallant stand of the French Naval Division at Dixmude under Admiral Ronarc'h, and Sir John French's masterly extension of his left flank to join the French on the

coast, gradually brought the German movement to a standstill. The situation on the coast was one to occasion the naval authorities anxiety, for the enemy's light naval forces were brought within less than a night's steaming of our coast and threatened our sea communications. In fact, the whole position had undergone an unexpected and unwelcome change.

This carries the history of the Dover Patrol down to the point at which I am able to bring personal knowledge to the narrative, carrying it on to the end of 1917, when I was suddenly superseded.

Early in 1915 I was in France in command of the 15-inch howitzers, which had been designed and constructed under me at the Coventry Ordnance Works. It was congenial work. In April I received a telegram to go to the Admiralty, and found Mr. Churchill and Lord Fisher were anxious to send one howitzer to the Mediterranean—to be landed at Gallipoli. They wanted to know when one could start, and I promised, if they telegraphed at once to my headquarters in France, to have one ready to leave in two days' time, provided suitable trucks were available. I left the same afternoon with the French Naval Attaché, the Marquis de St. Seine, to arrange about the trucks. The next day we brought down the howitzer by road and I was prepared to leave myself for Paris *en route* for the Dardanelles.

The next evening I received another wire calling me to London. I saw Mr. Churchill, who asked me to take command of the Dover Patrol. I was not at all anxious to do so, as I was looking forward to going to the East; I knew nothing of Dover and of what work was being done there. Nevertheless, I left the next morning for Dover and found that Rear-Admiral Hood was no more anxious to go in charge of light cruisers off the Irish coast than I was to relinquish my guns. However, the change was made and the next morning I took over the command, not without considerable misgivings, as I understood from Lord Fisher that the tenure

of the Dover Command varied directly with the number of submarines sunk! Apparently this was to be quite independent of the difficulty of the problem of tackling them, which was one to which, at the time, not much attention had been given. As I had started the submarine boats in our Navy in 1900 and had held the appointment of Superintending Captain of Submarines till 1904, I had a good knowledge of the difficulties of locating and attacking successfully even the early classes of boats—small, slow, and with a limited radius of action.

I anticipated quite a short stay at Dover. My predecessor and I could have written, as did Lord Nelson to Lord St. Vincent on taking up the command of the Dover Patrol: “Everything, my dear Lord, must have a beginning, and literally we are at the foundation of the fabric of our defence.”

I found that the Patrol was organised mainly with a view of submarine-hunting to prevent them passing the Narrows and attacking our merchant shipping, and that certain vessels were available for bombarding the enemy’s positions on the Belgian coast. Everything that could have been done, Admiral Hood had done, and it was merely for me to continue his work and amplify and expand his organisation as further resources became available.

It would only be wearisome to attempt a chronological account of the doings of the Patrol. It is better to give accounts, I fear brief and in many respects incomplete, of the main activities, and further to do this from the point of view of the vessels employed. A certain amount of overlapping and repetition in the narrative has been inevitable, but the reader will, I trust, excuse this, realising that my purpose is to convey a clear conception of the various activities of the command. They were, indeed, very varied.

It will be convenient to divide the periods between 1915 and the end of 1917 into certain epochs which were marked by definite changes in the work of the Patrol.

The first period was from April 1915 to August of the

same year—when our main work consisted of drifting nets to catch submarines, and in working out a system of long-range bombardment, besides devising and providing the material and equipment necessary to carry it out. During this time the 12-inch monitors began to arrive. In July the first mine-field was laid by enemy submarine—an unexpected and unpleasant development.

The second period extended from August 1915 till March 1916. During this time bombardments with the monitors of Zeebrugge, Ostend, and the coast by Middelkerke and Westende were undertaken—when the weather permitted. Our air force was augmented, and spotting from aeroplanes and seaplanes brought to a state of real utility. During this time also minelaying by the enemy's submarines increased to an alarming extent, the old drift net system proving useless to stop their operations. A plan to block Ostend was worked out and the necessary vessels fitted, but the attempt was abandoned, as a project to land troops in that port behind the enemy's guns was being considered jointly with the army in France, and it was thought most injudicious to close the northern ports, since we might have occasion to use them for our own troops. This was a consideration that was urged by the military authorities almost to the very end of my period of command, as I shall explain later on.

The third epoch, from April till October 1916, saw the first barrage laid off the Belgian coast, which superseded the drift-nets; this stopped practically all mining in the Channel. The whole of the resources of the Dover Command were required to keep this obstacle intact, with a daily patrol in sight of Ostend and Zeebrugge, and at the same time to protect the Downs and our merchant traffic. One 12-inch, Mark X, and four 9·2-inch guns were landed on the French side of the Channel for work ashore.

The fourth period extended from October 1916 to March 1917, when winter weather necessitated the raising of the Belgian coast blockade. The 15-inch monitors arrived and made

bombardment again possible, and preparations were made to carry out fresh bombardments of Zeebrugge and Ostend. The landing in Ostend, as originally planned, was abandoned in favour of one on the shore near Middelkerke, where possibilities of a larger front for landing existed. Two more 50-ton 12-inch, three long 9·2-inch and eight 7·5-inch guns were mounted ashore. This period also saw the beginning of the raids by enemy destroyers on the Channel, and ended in circumstances which will be described. The net barrage from the Goodwins to Dunkirk was laid, and I obtained approval to lay a mine barrage from Folkestone to Grisnez as soon as mines became available, as this was the only method of stopping submarines passing down the Channel. Mining by the enemy in the absence of the Belgian coast barrage again became a nuisance.

The fifth period, from March 1917 to January 1918, was one of expectant waiting for the Great Landing on the Belgian coast, which, owing to the Army being held up on the Passchendaele Ridge, had to be abandoned in October. The Navy, in short, waited for the Army and then came the great disappointment, for the Army was unable to co-operate. During this period, the second barrage was laid off the Belgian coast, and the Patrol started and kept going right into the winter, thanks to the good sea-going qualities of the 15-inch monitors. The Folkestone to Grisnez mine barrage was laid, and the first enemy submarine blown up in it before it was completed. It eventually confirmed my conviction as to its value as the antidote to the submarine, and became the graveyard of scores of submarines. Zeebrugge and Ostend were bombarded at this period with such success that the latter port was deserted, and never used again by the enemy as a naval base. Plans were prepared for bombarding Bruges at a range of twenty-two miles, and the necessary alterations to the monitors were begun. During this, the last months of my appointment, the blocking of Zeebrugge and Ostend was planned, and the details approved, since all hope of using

these ports in connection with a Flanders offensive by the Army had been abandoned.

This brief survey will give, perhaps, a sufficient suggestion of the progressive nature of the work of the Dover Patrol. With the events subsequent to January 1918, I need not deal except to remark that this period saw the completion of projects which had already been planned, not in some cases in the way the Dover Patrol of 1917 would have wished. The monitors were not completed in time to bombard Bruges, and the details of the Zeebrugge and Ostend attack were unfortunately altered. No new project was carried out before the Armistice was signed which had not been initiated in 1917.

On my taking over the command early in 1915, the staff of the Admiral at Dover consisted of two Flag-Lieutenants, a Secretary, and two clerks. The Dockyard—a development of the war—was under Mr. A. D. Shortridge, the Director of Works, with shipwright and engineering foremen under him. The 6th Destroyer Flotilla, which was based on Dover, was commanded by Captain Charles D. Johnson, who was himself in the *Attentive*. The drifters were in charge of Captain Humphrey W. Bowring, and the trawlers of Captain Vansittart Howard. The examination service was administered and commanded by Captain G. N. Tomlin.

Soon it became apparent that an increase of staff was necessary. Captain Bowring was appointed my Flag-Captain—the Admiralty refused to appoint him as Chief of Staff as he was said to be too junior! What that had to do with his appointment I never could understand. He did the work of Chief of Staff and in the only war of a life-time—of a century—surely red tape of this description might have been ignored. It was not till a captain junior to him on the East Coast was made a Commodore that the Admiralty consented to his being recognised as Chief of Staff. Again, what this had to do with his qualifications was not apparent. Queer to relate, his successor, Captain Evans, was also subjected to the same quaint restriction. To us at Dover at war—

very much at war—these absurd peace methods were incomprehensible and galling.

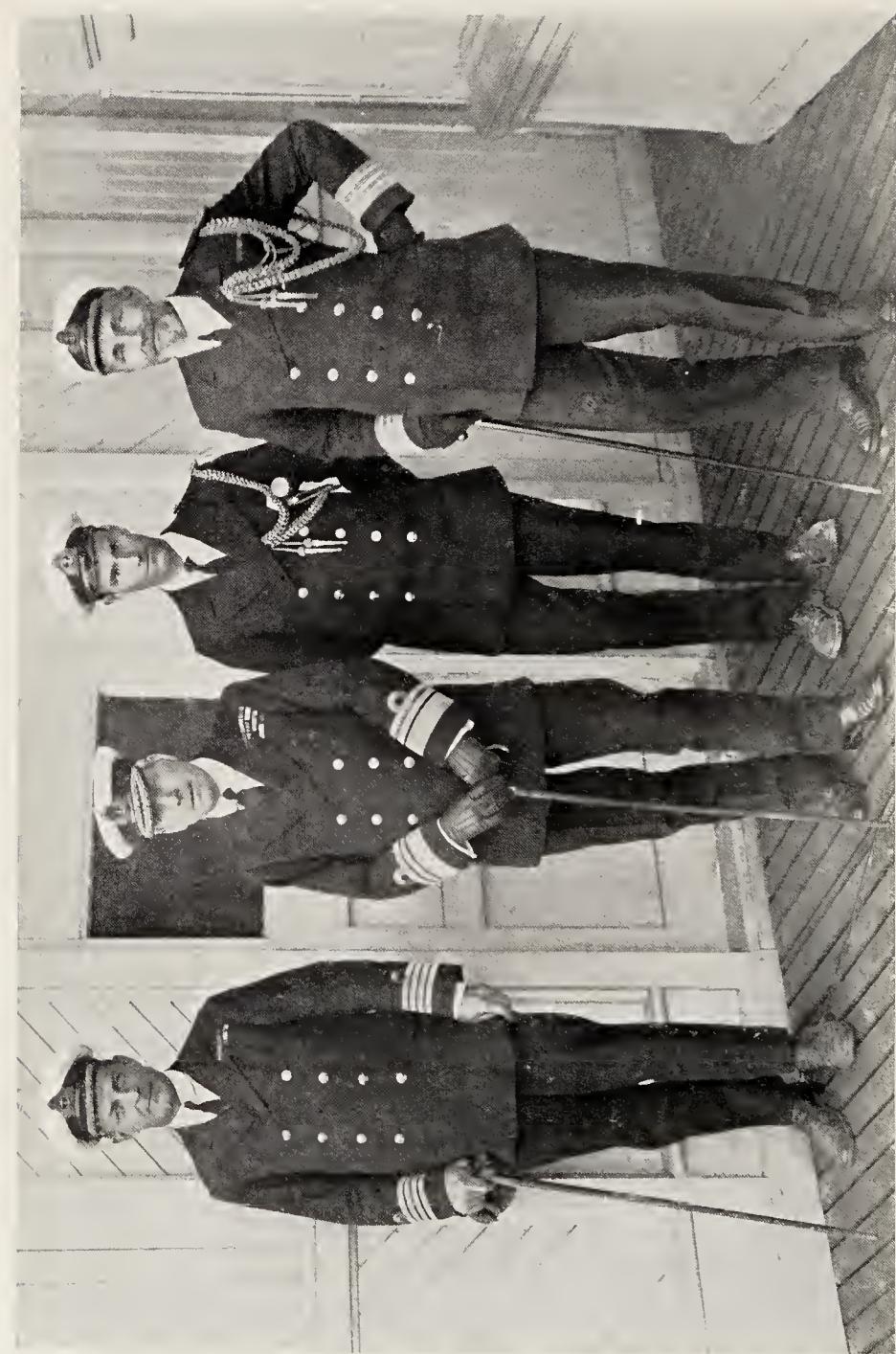
In Captain Bowring I had a tower of strength. He combined hard-headedness with the knowledge of a seaman (not so common as might be thought by some persons, and he was well liked by all, in spite of a sternness of manner, which is always a good thing in an officer in a position of command. It was much to my regret that he left Dover to take up an independent command in the autumn of 1917. He was succeeded by Captain E. R. G. R. Evans, C.B., of Antarctic fame and known to the public from his share in the *Swift* and *Broke* encounter with enemy destroyers. I had watched him during the period of my command and selected him for his sterling qualities. In Paymaster Commander Walter Gask, my Secretary, I was also extremely fortunate. On many occasions in my absence he had to act on my behalf, and always did so with judgment. Lieutenant R. P. Keigwin remained on as Interpreter Flag-Lieutenant and was a valuable assistant, and Lieutenant Llewellyn V. Morgan, who subsequently came as my Flag-Lieutenant and signal and wireless telegraphy expert, was of great assistance to me.

As the gunnery exercises increased, I felt the necessity of having a gunnery commander, and with great difficulty extracted one from the Admiralty only by taking Commander G. R. B. Blount out of the *Revenge*, a ship under my orders. But I was fortunate in my choice. The shadow of the Grand Fleet was over everything. The efficiency of that bulwark of the country was rightly considered to be of paramount importance, but we did want a few crumbs at Dover! We had a most difficult role to play, and it was necessary that we should have officers of high qualifications, even if one or two were juggled from the Grand Fleet. A navigating officer was also necessary, to carry out the chart preparation of the sailing times of the transports and a multifarious number of similar navigating details. I was indeed fortunate in obtaining Commander J. S. G. Fraser, whom I cannot praise better



Jean-Bapt.

PLATE I.



THE ADMIRAL AND STAFF AT DOVER.

Fleet Faymaster Walter Gask, C.B.
Flag-Lieut. I. Vaughan
Morgan, D.S.C
Secretary.

Captain H. Bowring, D.S.O.
Chief of the Staff

PLATE II.

than by saying that in all the hundred-and-one things he did he never once made a mistake.

My office was badly under-staffed in officers. I made it a rule that every operation order was to be typed by an officer in order to ensure secrecy. I had a big tug-of-war with the Admiralty to get the number of officers increased. No R.N. officers were available, and I begged without success for a R.N.V.R. officer. At last I succeeded, but only by telling the particular authority at the Admiralty concerned that his refusal meant my sitting up at night typing my own orders. I do not mention these tussles in any carping spirit, but the Admiralty can be improved by war experience as well as any other body or individual, so that leaving this criticism on record may perhaps on some future occasion aid the judicial spirit of those who have to allot officers to the various theatres of war.

Later on, as work increased, other officers were added—Captain H. C. J. Grant for intelligence duties, Captain C. L. Lambe—capable and level-headed—as head of the Air Service and a scientific Flag-Lieutenant, Lieutenant E. D. Hercus, who was of much assistance to me. I am glad that Dover was the first place, and I feel honoured that I was the first Flag Officer, to have a scientist officially allowed on his staff. Lieutenant Threlfall came to take charge of the smoke experiments, Commander Bickford was detailed for mounting guns. And so the staff increased, never redundant in individuals and all with their special functions.

Engineer-Captain Parsons was practically my Engineer-Captain, although really appointed in charge of the machinery of the 6th Flotilla. His work is a record of achieving the impossible by keeping efficient the overworked 6th Flotilla, more especially the 30-knotters which should have been on the scrap-heap before the war; but in war old material is better than none—our usual alternative during the early days of the war at Dover.

Enough has been said to indicate the skeleton of our organisation, which will be referred to more fully later on.

CHAPTER II

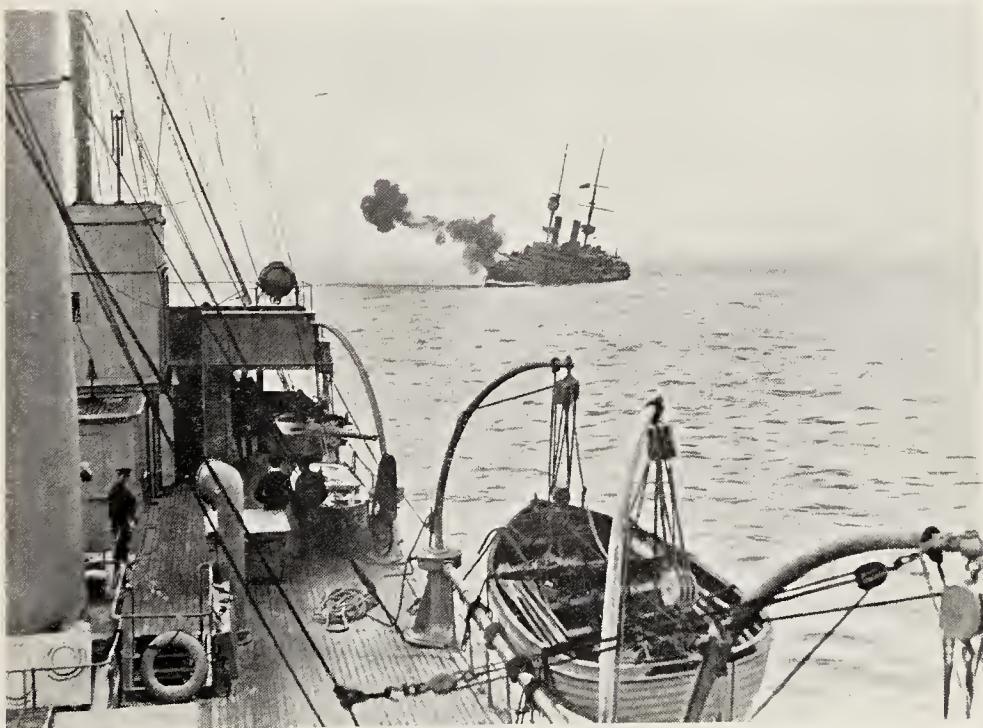
THE SHIPS OF THE DOVER PATROL

Twenty-four distinct types of fighting vessels—The last work of an old battleship—Fifteen-inch monitors—The vagaries of the *Marshal Ney*—Navigational difficulties—Vessels for coast bombardment—The appearance of the 18-inch gun—The rolling capacity of the 9·2-inch monitors—The work of the 6th Flotilla—The misnamed “30-knotters”—The successful “P” boats—Horse Artillery guns in the “M.L.’s”—Mine-sweeping work—Aeroplanes and seaplanes—Reliability and the preparation of plans.

IT may be advisable at this early stage to give a very brief description of the various vessels of the Dover Patrol, so as to enable the reader to understand their different functions. There were twenty-four distinct classes of fighting vessels in the force, and the variety was a measure of the diversity of the functions of the Patrol. Incidentally this variety did not, as might have been expected, increase the difficulties of the command, but simplified them, much as the equipment of a workshop with a variety of special machines facilitates manufacture. As to the crews, I shall have more—much more—to say before I finish; but, here and now, I may remark that they came from all parts of the country, coast villages as well as inland towns; they included men of all sections of society and of the most varied experience. There was an M.P. among them, and another who eventually became an M.P. Among them also were men of leisure, merchants, artists, as well as professional musicians, commercial travellers, barbers, tradesmen and workmen, with, of course, a stiffening of naval men. I am filled with pride when I think of all that the officers and men of the Dover Patrol, face to face with unforeseen conditions, achieved.



A 12-INCH MONITOR BOMBARDING WESTENDE ON THE KAISER'S BIRTHDAY, 1915.



H.M.S. "REVENGE" FIRING AT THE WESTENDE BATTERIES BEING HEELED OVER
TO GIVE GREATER ELEVATION TO HER GUNS.

PLATE III.



MOTOR LAUNCHES AT SEA WITH THE FLEET RETURNING FROM BOMBARDMENT
OF OSTEND DOCKYARD.

PLATE IV.

But I set out to write of the various types of vessels which composed the miscellaneous fleet. It would have been only fair to have commenced this brief account with that class which distinguished itself most in the period under review, but that is impossible. How can any one who knew each and all as well as I did choose between them? Monitor, M.L., destroyer, drifter, trawler, etc., as the recollection of the months of fine service passes through the mind, a host of incidents crowd the memory and render choice invidious. It is best, therefore, to take size as the order for description and avoid any decision which, while fair to the one, would be unfair to the remainder.

First and foremost, then, we had in the Patrol the *Revenge* (Captain V. B. Molteno), afterwards called the *Redoubtable* when the new battle-ship *Revenge* was commissioned, and classed with her was the *Venerable*, the ship that temporarily relieved her. The *Revenge* was an obsolete battle-ship fitted with water-tight compartments exterior to and below the water-line of the ship, generally called bulges; they served as an exploding screen to Whitehead torpedoes. She had two turrets with 13·5-inch short guns, relined and reduced in bore to 12-inch; these guns had a range of about 16,000 yards. There was a 6-inch battery with a range of about 13,000 yards. The range of both could be increased by heeling the ship over to increase the elevation of the guns. Plate III. shows her in this condition. This expedient had, however, the disadvantage of exposing the hull below the water-line on the attacking side, with the chance of being holed below the belt. A more unsuitable vessel for coast work could not be imagined; her draught of water was twenty-nine feet, far too much for close navigation among the shoals and mine-fields. She had the one virtue of possessing four heavy guns of moderate range, but, except for this, had most of all the bad points possible. At the time, however, she was of value in that she offered us the possibility of firing on Westende or troops in reserve in that neighbourhood at a range that suggested some probability

of injuring the enemy without the ship being in turn seriously damaged. The position from which her fire was most effective was in West Deep, near the Bell Buoy. To reach this spot she had to go through the Zuidcoote Pass, which she could only navigate in safety for two hours each side of high water. At these hours the tide was setting directly across the Pass with a speed of from one to three knots. However, as is frequently the case, the more awkward a piece of navigation the safer it really is, owing to the care and concentration of attention at the moment which become necessary. It is lapses in attention that usually lead to navigational disaster. Once inside, there she had to remain for at least eight hours, only eighteen miles from Ostend, with open water between her and the port. Nor was it an easy matter to protect her, as her escort of destroyers had but little to guide them underweigh at night, and at anchor they were useless in the event of either destroyer or submarine attack. In spite of these disabilities the *Revenge* figured in several operations, and, in addition, was of the greatest value in carrying out firing trials in the Thames, on which the whole structure of our subsequent long-range firing was based. So that her association with the Patrol was one of value and benefit to us. She suffered under one other defect : she had the prestige attaching to a battle-ship, which, while valueless in increasing her services, would have reflected undue glory on the Germans if they had succeeded in sinking her.

Of 15-inch monitors there were four : the *Marshal Ney* and the *Marshal Soult*, and, later on, the *Erebus* and the *Terror*. The first two joined the Patrol at the beginning of 1916, and were a distinct improvement in gun-range over the 12-inch monitors, as 25,000 yards could be obtained instead of 21,000. Unfortunately they were too slow for our work, only about five knots being generally obtained. Five knots, with an ordinary tide of three knots against the ship, does not mean rapid travelling, nor does it aid navigation among shoals ; moreover, their steering was atrocious. It was not

uncommon on the banks off the Belgian coast for one of these ships to swing eight points, or ninety degrees, off her course, and neither helm nor propeller would easily bring her back.

These monitors did useful work with their guns, as will be narrated later on, but they also, especially the *Marshal Ney*, provided the Patrol with excitement and amusement. Good old *Ney*, with her cheery Captain, Captain Tweedie!¹ How we missed them both afterwards! Reliability both in officer and a ship is the first thing that an Admiral values. The *Marshal Ney*, judged by this standard, was a hopeless sinner; but her officers and men made up for her deficiencies. Her engines not infrequently exploded when asked to start; her engine-room was scarred as if by shrapnel from the fragments of burst cylinder heads, and the escapes of the engine-room staff were miraculous. Her Chief Engineer, Mr. Swan, stuck to the engines like a Trojan and almost overcame their bad habits; and really, when talking to him, you were almost converted to the opinion that just one little alteration would make them start next time the ship was required. Added to this, when they did not burst, they usually would not start, and when once started no one liked to stop them for fear of not being able to start them again. But, without exaggeration, the more they burst and the worse they behaved, the more Mr. Swan loved them and the more cheery Captain Tweedie became.

On one occasion before the days of smoke screens, when we were firing at the observation stations and military headquarters at Middelkerke, a German battery, the Tirpitz, took us on, but at almost extreme range, so the fire was only moderately accurate. The *Ney* was specially marked out by the battery for its attention, so I ordered her to weigh. This she did, and started her starboard engine. The port engine, however, refused to move; her helm jammed hard a-starboard; and so she commenced turning a series of circles. The supply of compressed air for engine-starting ran short,

¹ Captain Hugh J. Tweedie.

so it was unwise to stop the starboard engine as that engine was working the air-compressor. Round and round she went in the tide-way, quite out of control—unable to start the port and afraid to stop the starboard engine, with the *Tirpitz* 11-inch shells just missing her, until the *Viking*, Commander Edward R. G. R. Evans, was ordered to come to the rescue and tow her. This she did in good style, covering the operation with a dense cloud of smoke from her funnels. The *Marshal Ney* then retired ignominiously back to Dunkirk in tow of the destroyer at twice her normal full speed.

A sense of humour quite made up for such minor annoyances. In the early days, before the extent of enterprise on the part of the enemy could be gauged, the monitors, including the *Ney* and *Soult*, always berthed at night inside Dunkirk harbour. Each passage in and out of the narrow, shallow entrance presented possibilities of untoward happenings; but careful handling, anchors, and an element of luck saved the wooden estacades¹ on all but one occasion. Eventually the *Marshal Ney* was paid off to turn her turret over to one of the new 15-inch monitors and to have her engines radically altered. In the early part of 1917 she returned to the patrol to do guardship in the Downs, the merchant ship anchorage, with a good armament of 6-inch guns. Her advent was characteristic. Off Dungeness she met an easterly gale and a westerly tide, and signalled that she was helpless and in danger of grounding on Dungeness. If, however, she kept the sea on her port bow I knew that the tide would take her clear of the point; so to cheer up her new captain, who evidently did not know her peculiar habits, I wirelessed to him that he was all right and that “the *Marshal Ney* usually navigated the waters of the Patrol sideways!” As a protection to the Downs, she was of considerable value.

The *Marshal Soult* had far more reliable engines, but her steering was bad and her speed slow. In fact, on the advent

¹ Estacades are the wooden piers built out to sea, flanking the dredged entrance to narrow harbours.

of the *Erebus* and *Terror*, being loth to lose two additional 15-inch guns, I used to have her towed by one of these to the offing of the places that we were going to bombard. It was a cumbrous method of going in and out of action, and with a more active enemy would hardly have been justifiable. Moreover, it reduced the speed of the whole squadron, which, on short summer nights when long trips across the North Sea had to be made, was a distinct disadvantage. Her guns were good. Her captain, Captain William D. Paton, and afterwards Commander George R. B. Blount, and her officers and men were keen, so that, in spite of her shortcomings, she was a valuable unit. Towing over the shallow banks required care on account of her tendency to sheer over without warning. In fact, on the first occasion when this was tried at night, off she went, parted the bower chain to which the hawser was shackled, broke her windlass, and fouled her propeller, which stopped all operations for that night. Later on she had to take her place on the patrol line off the Belgian coast, but her days on patrol always demanded vigilance, as her speed against the tide was only two knots, and she had to be recalled on any signs of a rising south-westerly breeze, otherwise she was helpless to remain even stationary; I had no desire for her to end her days by going stern first up the Scheldt!

The *Erebus* and *Terror* were the two great assets of the Patrol for bombardment purposes during 1917. A maximum speed of fourteen knots, with twelve knots when steaming comfortably, was an absolute luxury. The secondary armament of two 6-inch Q.F. guns was poor, especially as the least range of the 15-inch was about 2,000 yards, so that if rushed by destroyers either of these ships had merely one 6-inch gun on a broadside to rely on. During the preparation for the Great Landing in 1917, of which I shall have more to say, the whole of the patrol work fell on these two vessels, and well they did their arduous tasks, as well as the more congenial duties of bombarding Ostend and Zeebrugge. It is impossible to

convey the relief that was afforded to me by having two ships that could be relied on to navigate in any weather. Both had serious mishaps, as will be narrated later : the *Terror*, with three torpedoes in her, exploded forward, and the *Erebus* was mined by an electrically controlled boat amidships ; but both survived, monuments to modern naval scientific construction. The *Terror* was commanded by Captain Charles W. Bruton and the *Erebus* by Captain Charles S. Wills.

Of the 12-inch monitors, the *Lord Clive* was commanded by Commander Norman Carter, and afterwards by Captain Bernard St. G. Collard, the *Prince Eugène* by Captain Ernest Wigram, the *General Wolfe* by Captain John A. Moreton, the *Prince Rupert* by Commander Harold O. Reinholt, and the *General Crawford* by Commander Edward Altham. These formed the backbone of the fleet for bombardments during 1915 and for the patrol off Ostend and Zeebrugge during 1916 and part of 1917. They were detailed to run the pontoons ashore in the Great Landing, of which I will say more later on, and two of them were to run into the breakwater for the blocking of Zeebrugge and the attack on the Mole as was originally proposed ; but, unfortunately, not so carried out by my successor. They took day and day about in patrolling the coast. Every night one of them anchored in the open off La Panne, fourteen miles from Ostend.

They guarded Calais against blocking and helped to defend the Downs against night raids by destroyers. They lined across the entrance to the Thames to intercept Zeppelins, and carried out most of the gun-firing to systematise our development of long-range firing. Three of them had 18-inch guns, fitted on their super-structure deck, to bombard Bruges at a distance of *twenty-three miles*. They were the chief vessels I had to break up any landing by the enemy on the French coast, if such had been attempted. For three months they were interned up the Thames while we were daily expecting the Army to push on far enough to permit of our carrying out our projected landing on the Belgian coast.

In fact, the only thing they did not do was to get much rest. Later on, their work will be more specifically detailed, but here it is well to record their general activities. Why they were not sunk, goodness only knows! The insult—to call it nothing more—the gross insult to the German Navy to anchor a 6,000-ton vessel in the open within fourteen miles of a strong submarine and destroyer base nearly every night for two years without her once being attacked! It sounds like a fairy-tale. Their armament was one turret mounting two short 12-inch guns with a maximum range of about 20,000 yards; subsequently in three of the ships two, and in the other three ships four 6-inch Q.F. or B.L. guns were mounted on their superstructures. Not much of a defensive armament against destroyers. One or two anti-aircraft guns and a couple of maxims completed their light armament.

They began to join the Patrol late in the summer of 1915, and before the Wilhelm II battery was installed to the east of Zeebrugge they were able to bombard the lock-gates and military works, which was done on three occasions. But the fire of the guns was not sufficiently accurate for so small a target as the lock-gates; they were more useful against buildings or larger areas. Three of them bombarded Ostend and tumbled up against the Tirpitz battery, whose existence was then unknown. They escaped sinking by a miraculous and unexplained chance. In 1916 they could only be used against Westende and Middelkerke at the extreme range of the Tirpitz battery.

When on the patrol line they were in danger of being rushed by three or four destroyers, in which case their defensive armament was so small that they must have been torpedoed, and, although they had bulges,¹ several torpedoes would probably have caused them to sink. Off La Panne they were vulnerable not only to torpedoes, but to boarding; half a dozen destroyers and a light, fast vessel with a large complement

¹ Compartments outside the ship at the water-line to explode torpedoes a sufficient distance from the side to prevent serious damage,

of armed men might have boarded and cut them out. Dearly should I have loved the Germans to have anchored a ship off Middelkerke at night. Not one was lost, not one torpedoed, not one mined. Their immunity is a lasting reproach to the German Navy.

Their speed was about seven and a half knots—nominally eight, usually a bare seven with a foul bottom, and in these waters their bottoms generally were foul. In a sea-way, their speed dropped off considerably, so that it was unsafe to leave them in the open water between the banks in anything approaching a gale of wind. They could enter Dunkirk at most tides, and had just room to turn in the harbour. They were splendidly handled, and were absolutely invaluable. Their captains deserve far more recognition than ever fell to them for their services during the war.

The 9·2-inch monitors were numbered *M. 21, 23, 24, 25, 26, 27.*¹ They were queer craft. Originally each had one 9·2 short gun, but these I got changed for either a 6-inch or a 7·5 single gun. They steamed about nine knots, nominally ten, drew only six feet of water, and handled well; their engines were generally reliable. But they rolled! When her 9·2-inch gun was still on board, the *M. 25*, while in the mouth of the Thames at anchor, rolled 180 degrees in ten seconds—that is, she made two complete rolls of 45 degrees each way, each occupying only five seconds. I dare say most of my readers have been in a ship which has rolled, and the majority of them have not liked it; but anything like this speed and amplitude of movement must have been unknown to them. So great was the velocity of the roll that the 3-pounder cartridge cases were thrown almost vertically out of their boxes into the air. But in this life we cannot have everything, and, if vessels have to be of abnormal design for definite purposes, then all conditions cannot suit them, and it is the business of the Admiral to use them under legitimate conditions. Sea life is, however, so tricky and uncertain that at times circum-

¹ Cf. Appendix III.

stances will arise which necessitate using special ships for general purposes, and then their bad points are brought out.

These vessels were mainly of use in protecting the larger monitors and destroyers on the patrol line from destroyer attack, for which purpose their guns, with a longer range than those of the enemy destroyers and a quicker rate of fire than the 12-inch guns of the monitors, were very valuable. Our destroyers' guns were outranged by those of the German boats, and therefore the latter liked to try and annoy our boats at long range. One quaint little action took place on a foggy day among the shoals between, on the one hand, *M. 26*, *M. 27*, and two of our small "30-knotters," armed with 12-pounder guns, and on the other, four German boats armed each with three 4-inch guns. After a short action, the Germans withdrew, having over thirty knots speed; but, had they rushed our vessels, they would have had a good chance of bagging the lot, especially as the rate of fire of their 4-inch guns was far greater than that of the 6-inch weapons of the small monitors.

The light cruisers, *Attentive*, *Active*, and *Adventure* were of use in backing up the destroyers on patrol. In the Straits they were too vulnerable to torpedo attack to make it safe to use them promiscuously. The *Adventure*, Commander Edward O. Gladstone, and *Foresight*, Commander Herbert Garnett, left the Patrol early in the summer of 1915, and subsequently the *Attentive*, originally Captain C. D. Johnson, then Commander Neston W. Diggle, and the *Active*, Commander Kerrison Kiddie, did all their special work. They were a valuable addition to the Downs defence, and on the Belgian Coast Patrol Line. Later on I succeeded in getting a 6-inch gun mounted on the *Attentive's* fo'castle to outrange the Hun destroyers' weapons, which was a valuable alteration to her armament.

The *Hazard*, Lieutenant-Commander L. A. D. Sturdee, was a useful gunboat, used chiefly as mother-ship for the submarine boats when they worked in the Channel on alarms of cruiser raids coming south. Lieutenant-Commander Sturdee, a

torpedo officer, was valuable to me as an experimental officer. All the early smoke experiments were carried out by him, and the progress made was largely due to his exertions, and those of Lieutenant William B. Threlfall, R.N.V.R.

The flotilla leaders, *Swift*, Commander Ambrose M. Peck; and *Broke*, Commander Edward R. G. R. Evans, and *Faulknor*, Commander Henry G. L. Oliphant, were comparatively late arrivals, but indeed welcome ones. It was the greatest comfort to have some fast vessels with superior armament to the German destroyers. I worked them mainly as an extra patrol in the Straits on all moonless nights. On one occasion two of them, when so employed, had a successful scrap with a German destroyer division, which will be more fully described when the doings of the 6th Flotilla are dealt with.

And that brings me to the good old 6th Flotilla, whose work was never advertised, but which did yeoman service during the three years. No flotilla in the Navy had such a time, such incessant work, such arduous work, or even such responsible work as these war-worn vessels. At the start there were twelve Tribals : the *Afridi*, *Amazon*, *Cossack*, *Crusader*, *Ghurka*, *Maori*, *Mohawk*, *Nubian*, *Saracen*, *Tartar*, *Viking*, and *Zulu*, and twelve "30-knotters."¹ The commanding officers changed often, and were moved up to better boats as opportunity occurred, so no captain can be specially identified with any particular boat, but only with the Flotilla as a whole. Their duties were many and varied, and to detail them briefly is so impossible that a special chapter is devoted to this work. The only points that need here be emphasised are that the Tribals were old boats, built about 1906. Their speed, though good, was inferior to the latest German boats'. They belonged really to two distinct classes of six boats each—those mounting two 4-inch guns and those mounting four 12-pounders. The 12-pounder boats were, of course, useless to stand up against the German 4-inch boats, and our 4-inch Tribals mounted only two against the three guns of the

¹ For the names of the captains *vide* Appendix III.

Germans. All round, therefore, they were inferior to the modern destroyers of the enemy, which, considering their age, was not to be wondered at.

The "30-knotters" dated back to about 1897 or 1898, so they were sixteen years or so old at the beginning of the war. Their classification as "30-knotters" was an absurd misnomer, twenty and, perhaps, with some, twenty-five knots being their fine-weather speed. They were fit for escort work and for patrol except when it was blowing a gale; but they were totally unfit to be out in winter weather in the Channel. However, in war-time one cannot pick and choose, and at Dover I was glad to get anything that could steam and would float.

The "P." boats were among the most successful of the war-designed and built vessels. They had a speed of twenty knots, carried one 4-inch gun, possessed geared turbines, and were of shallow draught; they were very handy, good sea-boats, and were ideal light patrol vessels. Their light draught enabled them to patrol with greater safety than destroyers in unswept waters where mines might be lurking. They were sufficiently armed to be capable of taking on submarines. They were also most valuable in certain operations on the Belgian coast for measuring distances by the use of a taut wire laid from a drum, as I shall explain in due course. They could keep the sea in any reasonable weather, of course at reduced speed. They were thoroughly reliable, and their officers and men did good service.

A word must also be said about the Kite-balloon ships. First, the *City of Oxford*, Commander John Brown, then the *Menelaus*, Commander Charles McCulloch, were sent for use in observing firing on the Belgian coast. They were large merchant vessels of considerable draught of water with a special hold forward which could take an inflated kite-balloon, and a hatch the full size of the hold. They were well equipped, but too large for work on the coast, so that a smaller vessel, a barge called the *Arctic*, was obtained to hold a balloon, which, when used, was transferred to and towed by a trawler. The general

condition of the coast altered so rapidly, and observation by aeroplane improved so vastly, that little opportunity occurred for the use of the balloons. They, however, filled in a gap in the transition stage, and might have been called into active requisition if the Germans had tried to advance along the coast.

The Motor Launches, or “M.L.’s” for short, deserve special mention. They were a good example of a makeshift hostility class of craft, which were useful for most purposes for which they were *not* originally intended. What a gallant little flotilla they were, and what wet, cold and exposure their crews endured under Commander Hamilton Benn, the keen and skilled yachtsman, who commanded them! Their good discipline and work were undoubtedly largely owing to his gallant example and fine leadership. Originally they were intended as patrol vessels. Well, there were places they might patrol in, but Dover Straits was not one. Rarely could they stand the sea in that locality. Moreover, originally they had old Horse Artillery 13-pounders fitted to a ship mounting. Most of them, however, were eventually robbed of this weapon to arm merchant ships, so that they were left practically defenceless in a fight with a submarine. They were about seventy-five feet long, with a twelve-foot beam, and had two petrol engines. Originally they had the noisiest of exhausts, enough to frighten a submarine miles off. The engine-room ventilators discharged around the captain and helmsman, enveloping them in most unpleasant fumes. But they did good work, as will appear later on.

The trawlers and drifters are fully dealt with in subsequent pages.

The gunboats *Excellent* and *Bustard* were old gunnery tenders, originally sent for use on the coast, Commander Gerald L. Saurin and Lieutenant-Commander Owen H. K. Maguire being in command respectively. In the early days these vessels did good service, but, with the increase in range of the enemy’s coast batteries, and the development in

accuracy of our fire from the monitors, with their longer range guns, they became obsolete for our purposes and were paid off. It was no good merely shooting into Belgium, which was all such small, unsteady platforms were capable of doing. During their careers they had, however, many scraps with the Westende Coast Batteries.

The mine-sweepers were of two distinct classes—trawlers and paddle vessels. The former were good sea-going vessels, and would sweep in anything short of a whole gale, but they drew anything from fourteen to eighteen feet—a dangerously deep draught for mine-sweeping. The paddlers were originally the ordinary shilling tripper boats of peace days, good only in fine weather, but then very useful. Later on, the Race-course class, whose names were refreshing reminders of peace and sport, became available. These, again, were all right in fine weather, but in a sea-way their paddle-boxes got choked with water and their speed fell off.

These were succeeded by the Tunnel Class, or Dance Class. They were called “Tunnel” because they had propellers in tunnels, which reduced the depth of the propeller, and “Dance” because their names were those of dances. When the first of these was sent to Dover every one condemned her as unseaworthy. I, however, was so impressed with the vessel’s good points, her shallow draught especially, that I sent her over to Dunkirk to work under the lee for progressive trials in various weathers with satisfactory results. These vessels were later on, I believe, highly thought of.

More will later be said of the Coastal Motor-boats—the “C.M.B.’s.” They were very fast small boats, which might be described as half boat, one quarter seaplane, and one quarter torpedo; they were of use for very special work only.

The Dover submarines were, broadly speaking, C-class boats only; one or two E class were subsequently borrowed. Their work was much restricted by the peculiar conditions of the patrol. Their crews lived on board the *Arrogant*; Commander A. R. Palmer, and later Commander H. Spencer, of the London

Fire Brigade, were her captains. This ship gradually developed into the depot ship of Dover harbour. When in Dover I flew my flag in the *Arrogant*.

The *Riviera* was a seaplane carrier. She was a ship that promised to be of great service, but gradually lost in value, the real truth being that the progress in aeroplane design and construction quite eclipsed seaplane design on speed and reconnaissance and spotting work. The reasons are interesting and are given later on. The difficulty always was to hit off weather when seaplanes could be hoisted out of the carrier and rise off the water; many disappointments gradually led to the use of aeroplanes only, and the *Riviera* left for other waters where she could be of greater service.

The yachts attached to the drifters and trawlers did good work. For the drifters they acted as wireless stations and as links of communication, and did much the same services for the trawlers before these vessels were fitted with wireless. Of course for defensive purposes they were useless, but at the same time their size in some manner gave a feeling of support to the smaller boats. Psychology in war is not to be ignored.

The armed boarding steamers at Ramsgate carried out the great work of examining all vessels passing through the Straits. They were for the most part small passenger steamers or tugs in peace-time. They were well suited to their work, which was incessant.

The last ship to note is the S.S. Air-ship, the smallest of our naval air-ships. Of these air-ships and, afterwards, of the coastals, we had several subsequently. They patrolled the air, observing the water from Dungeness to Boulogne and the area between that line and Beachy Head to the French coast on a due south line. Their chief function was to keep submarines down and prevent them lying on the surface in this patch of water. This they could do by dropping bombs near them. It was a hundred to one against sinking them. Lieutenant Cunningham had originally the organisation of this force, and most ably carried out the work.

Such were the vessels of the Dover Patrol—twenty-four different sorts of vessels, numbering somewhere about 400 all told, each class having its own function. To an Admiral in command of an area like the Dover Patrol in war-time all vessels fall roughly into two classes—those for general service and those for special purposes. The general service vessels, such as the 15-inch monitors, Tribal destroyers, and trawlers, could be used in all weathers for any duty within their capacity; there was never any question as to whether they could or could not do their work. The one quality an Admiral demands in men and general service vessels is reliability. It is on their reliability that all his dispositions and plans are built.

Other classes of vessels are mere adjuncts for special work affected by weather or other circumstances. Of this type, the drifter was a good example. In herself reliable under all conditions of weather, her nets were not. On the approach of bad weather she had to haul in her nets. The 12-inch monitors were also excellent in their way, but their inferior speed in a sea-way necessitated abandoning the Belgian Coast Patrol in the winter of 1916–17. Similarly, motor launches were fine-weather boats only; to rely on these to sweep for mines was like leaning on a rotten reed, since a very moderate sea put them *hors de combat*, and all the mine-sweeping programme had to be revised, and the day's programme upset.

In running a big command like that of Dover, on which a considerable portion of the commerce of the country depended for safety, strict routine in all such matters as mine-sweeping and commerce protection was a necessity. Any element of uncertainty in carrying out the programme of work might mean holding up many thousands of tons of shipping for several hours. Hence, trawlers and not M.L.'s were the real mine-sweeping vessels. Of course, bombardments or any such special operations are contingent on weather conditions, as smooth water is necessary, since shooting is no good unless you hit the object at which you shoot. Hence special vessels and special auxiliaries can, and must, be em-

ployed to get the best results. For the coastal work and work among shoals and waters where enemy's mines may be met with light draught vessels, as heavily armed as possible, are required. Their construction must be of a special character and consequently there is no expectation that their use will be universal. The Tunnel mine-sweepers drew only four feet of water, and it could not be expected that they would have the sea-going qualities of twenty-foot vessels.

The force based at Dover, or operating from Dunkirk, was, as I have tried to make clear, of a very miscellaneous character; many vessels were of a makeshift nature, to meet needs which were not foreseen, and which I doubt if any one could have foreseen, unless he had had pre-knowledge that the Germans were going to settle down on the Belgian coast within two hours steaming of Margate, or Ramsgate, or Dover, and remain there for three years, a continual menace to our communications.

As the war progressed new types of ships were designed and built, with the result that the difficulties tended to decrease and the efficiency with which the sea-work was done steadily improved. We should do well, in looking back over the events of the war, not to hold up our hands in surprise and horror because deficiencies were exposed by the course of events, and it was necessary to have recourse at first to improvisation, pressing into the service ships which were never intended for warfare, and making the best of them. We ought rather to take pride in the resourcefulness which men of varied previous experience showed at sea in the Narrows separating this country from the Continent in making the best possible use of the resources available.

In the matter of small craft we had far too few vessels to meet the manifold and conflicting demands of war—for war is a matter of hazards—but we were far better off in this respect than any of our Allies. In later months a large number of destroyers and special craft were turned out by the British yards to our great advantage at Dover. Were they of the

exact types we required ? I can unhesitatingly say that those designed and built in England during the war could not have been bettered, but many improvised vessels had to be used throughout the war. With the best endeavours on the part of the Admiralty, we were always short in numbers ; but, as a sea-officer, I never forgot the many preoccupations of the Admiralty, engaged in fighting in every sea, and especially with the paramount importance of maintaining the supremacy of the Grand Fleet.

From experience at the Admiralty before the war, I knew the impossibility of the country being kept fully equipped with vessels of all classes in peace-time, and never expected the Admiralty to supply me with all I wanted. If an Admiral has all his wants supplied, command becomes simple. The training of a British sea-officer teaches him to do the best with what he has and to improvise that which he has not. This at Dover we had ample and incessant reason to do. If we had had more we might, perhaps, have done more ; but, as we had not, we did our best with what we had, and I did not grumble at the Admiralty for not having achieved the impossible in peace-time.

In conclusion, we have much for which to thank the Constructive Department of the Admiralty under Sir Tennyson d'Eyncourt ; many were the vessels they devised and built for the Navy during the war. So far as Dover is concerned, I have nothing but gratitude to record for the vessels they sent us and all they did to meet our needs at a time when many demands were being made upon them. Whatever ships we got, we tried to make the best use we could of them—and, when all is said and done, these vessels did very well, even when used for purposes for which they were never intended.

THE DOVER PATROL

THE MISCELLANEOUS FLEET

At Dover we'd a splendid fleet, but not the orthodox
 Regulation fleet of war-time ; and some were rather crocks.
 When the war broke out the R.N.'s mostly went to Scapa Flow,
 And the R.N.R.'s and V.R.'s came to Dover for the show.

To swell the Dover Patrol, my lads,
 To swell the Dover Patrol.
 But they had jolly good fun when the war had begun,
 When we served in the Dover Patrol.

We had monitors of M. class and of twelve and fifteen inch,
 Which mostly steamed at six knots or seven knots at a pinch.
 There were little Coastal Motor-boats and M.L.'s for the screen.¹
 And P. Boats and the Hazard and the C class submarine,
 All had a job in the Dover Patrol !
 A tough time in the Dover Patrol !
 A time you may bet that was rough, cold, and wet,
 At sea in the Dover Patrol.

Of Destroyers we'd the Tribals and the ancient Thirty-knotters.
 We'd ships that carried kite-balloons and seaplanes for our spotters.
 We had steamers armed for boarding to search for contraband,
 And armed Drifters and Torpedo boats to lend a helping hand.

They all belonged to the Dover Patrol—
 Did good work in the Dover Patrol.
 It wasn't all glory, but the commonplace story
 Of hard work in the Dover Patrol.

The Drifters they caught submarines, and the Paddlers they were willing
 To drop their trade of making trippers seasick for a shilling,
 To join the Trawlers sweeping mines, and, aided by the yachts,
 Their harvest was a good one as the Channel yielded lots.

Yes, they came to the Dover Patrol—
 To the risks of the Dover Patrol.
 Alas ! many now sleep in the treacherous deep
 That lies under the Dover Patrol.

¹ The smoke-screen to cover attacks on the coast was burnt by the M.L.'s.

The different kinds of ships we had just numbered twenty-four;
And we'd have had some others if there had been any more.
Four hundred ships we totalled in our miscellaneous fleet;
But there's one thing I can tell you—they were precious hard to beat!
Beat? Beat the Dover Patrol?
Who said beat the Dover Patrol?
The Hun couldn't do it—no, not if we knew it.
In our day in the Dover Patrol.

CHAPTER III

MATTERS OF STRATEGY

The use of catch phrases—The position of the British and German Navies in 1914—The potential superiority of the enemy in destroyers—The right strategy for the Germans to have pursued—Our shortage of destroyers—How Germany failed to take advantage of her position—The absence of the sea instinct—Our ocean-borne commerce and the Downs—The points that the Dover force had to protect—The impossibility of blockading the Belgian coast—The difficulties of patrol work—Impracticability of defending all interests—Defending the left flank of the Allied Armies—The use of the Belgian coast patrol and the net barrage—Possibility of the enemy blocking our harbours—Assisting the Army by feigning landings—The advantages of the Belgian coast to the enemy—The probable effect of a Channel Tunnel if one had existed—Consideration of the factors that handicapped us during the war—The vertical mine barrage—Stopping submarines passing the Narrows—Deceiving the enemy.

“Well, Bill, all I knows about strategy is what I ‘eard the ole man¹ say, ‘ow that the strategy of these ‘yer Straits was so to dispose ‘is destroyers as to prevent the enemy knowing as ‘ow ‘e ‘adn’t got none.”

Naval strategical principles have been much obscured by indiscriminate use of catch phrases. “Stronger sea-power” is a good example. What is meant by stronger sea power? In reality nothing, except when applied to a sea-power superior in all classes of vessels, and also—what is equally important—with a superior force in each class free and available to pit against a corresponding force of the enemy.

The position of our Navy early in 1915 is an excellent ex-

¹ The Ole Man is the unofficial designation of the Admiral among the sailors.

ample of the limitations in the meaning of the phrase. We certainly were the stronger sea-power in battle-ships and cruisers and this gave us initially what is called the command of the seas—that is, we were able to prevent the enemy safely sending an oversea invading force to land in this or any other country, and, what is more vital, we were absolutely certain of preventing his keeping up sea communication with it if it were landed. It is this inability to keep up necessary communications which distinguishes a raid from an invasion. The British Admiralty never guaranteed the country against a raid of, say, 60,000 men thrown on to the coast and left there; but what they always did guarantee was that the Navy would cut off any further communication between that force and its parent country. The ultimate force that ensured this was the battle-ship fleet, because, being stronger than any ultimate sea force the enemy could bring to bear, it was able to prevent the enemy supporting any supply vessels.

The enemy's destroyers and submarines were a menace to such sea superiority since, although fleet for fleet we might be far the stronger, the fast destroyer at night and the elusive submarine by day could sink the Leviathan, and therefore the inferior fleet, plus these torpedo craft, might, in the day of battle, prove virtually the superior force. For this reason a battle-fleet was no longer merely a force of battle-ships and scouting cruisers. Protective vessels to deal with submarines and mines were a necessity, so that the battle-fleet force became a vast assemblage of capital vessels, cruisers, light cruisers, destroyers, submarines, and mine-sweepers, each with complementary functions.

Now the Germans, with a powerful fleet in being—that is, existing as a great fighting force ready any day for action—kept our vast array of vessels concentrated for the one purpose only of watching and engaging them. It was unsafe to detach any serious unit for any other purpose, since the choice of time for attack lay with the German Fleet; but, on the other hand, the Germans were able to detach any unit for raiding

or any other offensive purpose, always provided that their losses did not affect their attribute of being an efficient fleet in being, and therefore release for other purpose any important unit of the British Fleet.

The result was that the enemy had a great potential superiority in destroyers, if they had desired to raid our waters with them. Any night they could move these down to the Belgian coast and hide them in the harbours ready for a raid or a more serious offensive. The cloud of Wilhelmshaven lay heavily over Dover. The next point was that our commerce was distributed over the globe, and large concentrations of ships occurred in certain waters. The enemy had the ability, if they had chosen to exercise it, of building and sending out fast raiders to prey on our commerce—vessels like the *Emden* or the *Moewe*, and, possibly, improvements on these. Again, here they had a vast potential weapon for equalling our superiority in cruisers, for, if several of these raiders were pushed out together, some were certain to get through. These, spread over the globe, would have been a terrible scourge. We would have been obliged to detach fast cruisers to hunt them down. This would have meant a dissipation of strength, since hunting the oceans for a few ships is indeed like hunting for needles in hay.

The public, as a rule, has no appreciation of the vast immensity of the space occupied by sea over the globe. Accustomed to look at the atlas, the sea appears to be nothing in particular. Its vastness can only be appreciated by those who have thoroughly studied the problems of search in the open ocean. A cruiser in the South Atlantic may turn up in the Pacific in ten days, or equally well, in a similar time, appear in the Indian Ocean. A determined attack, of this nature, on our commerce would have inevitably meant convoys and escort by cruisers in every sea, with the consequent dissipation of strength and great loss of tonnage in our carrying capacity owing to the inevitable delays attending convoy sailings.

Many times, in passing the statue of Jean Bart in Dunkirk, I have congratulated our country that von Tirpitz and not he ruled the German naval destinies. Our battle-fleet would have been powerless to stop such raids, for, although superior in battle-fleet power, we were the weaker nation in destroyers and such light craft, and most vulnerable in our world-wide commerce.

Now the menace of the submarine, and especially when these vessels began indiscriminately sinking merchant vessels on October 21st, 1914, made a heavy call on our available destroyers. Already, with a considerable portion locked up for service with the Grand Fleet, the numbers available to face the flotillas of Germany were few, but the exigencies of submarine hunting still more depleted the numbers we had available. In fact, we were reduced far below the danger point.

The accepted strategy at sea is for the stronger sea-power to seek out and attack the enemy whenever met with, even if the latter is in superior force. Superior, please note, does not necessarily mean preponderatingly superior. The principle is that, if ship for ship is sunk, the percentage superiority of the stronger power rises. The strategy of the weaker power is not to fight unless he can do so with advantage and a good prospect of sinking more than ship for ship. The weaker power has, to a great extent, the ability to decide how it will use its weapons. Take, for example, the late war. Germany had the choice of fighting our Grand Fleet or keeping that Fleet immobile by using her own Battle-fleet as a threat. She chose the latter, and she may have been wise; but where she made the great mistake was that, while keeping her main fleet in being so as to try and paralyse our battle-fleet and its large quota of auxiliaries and destroyers, she did not use her destroyers and commerce-raiders like a rapier to make lightning thrusts at our most vital point—the Merchant Navy. She chose the stiletto of the submarine, too weak and too short in reach to inflict really vital blows at our sea-borne trade.

She would not risk her fleet losing its restraining power on ours by suffering a severe defeat at sea, and yet she kept her destroyers intact in full strength to work with that fleet in a rôle that there was apparently no intention of their carrying out.

The result was that she lost the war. If she had mustered every destroyer and light cruiser she could lay hands on, and had hurled them at our fleet in front of her own fleet in a bold and determined rush to close and sink ship for ship, trusting to her destroyers and their torpedoes to equalise numbers in the battle-ships, it is conceivable she might have won the action, taking into consideration that her vessels were built to fight and not to live in, and were, therefore, far more unsinkable than ours, which were constructed for all-world service. At all events, she might have come out of the fight with equal honours, and a prestige which would have raised the morale of her Navy to the highest point. On the other hand, she might have made feints of attack to keep our destroyers with our Grand Fleet, and used hers for secondary purposes—on their return they would have been again ready as a threat to the Grand Fleet at Scapa.

She, however, had no clear-cut policy. She wavered and failed lamentably, always trying to believe that, by using her submarines illegitimately, she could avoid a clear strategical decision as to the use of her major armaments. So far as we were concerned, we had so many uses for our destroyers—scattered to combat submarines and as escorts—besides having to keep a very large number with the Grand Fleet, that it was not to the advantage of our Navy to force destroyer actions unless we were certain of success; and, further, it was not to our advantage so long as we remained largely inferior in the available numbers of destroyers, to force any destroyer actions provided the enemy did not use his destroyers to attack our interests. But, with the traditions of the Navy behind us, and the ineradicable conviction that we could always knock the enemy more than he could knock us, it was too much to

expect that either captain, commodore, or admiral would follow such an antipathetic course. Still, care had to be exercised in the use of the vessels, a care wisely fostered by the Admiralty in not filling up losses in the Dover flotilla as they occurred, which course brought the admiral face to face, in a very practical manner, with the necessity for husbanding those resources that he could least spare.

It was here that the enemy mistook altogether the grand game he had to play—a game that might have reduced this country to the verge of starvation. Had he built and pushed out armed raiders, at the same time using his submarines legitimately; had he concentrated and attacked our shipping in the Channel, on the East Coast, and in the Downs with destroyers, our Admiralty would have been on the horns of a bad dilemma. They would have been forced to dissipate cruiser strength abroad and also to keep a large destroyer force at Dover. Where were these boats to come from? There were only two possible sources—the Grand Fleet and submarine-hunting. Hence, inevitably, the fighting efficiency of the Grand Fleet would have been impaired, convoys would have had to be instituted, and the destroyers taken off submarine-hunting. The insult of the enemy sinking vessels in daylight off our coasts with surface craft would have been greater than the country would have stood. One or two really large raids on our shipping would have kept a large force of light cruisers and destroyers in the south as useless for other purposes as those of the Grand Fleet at Scapa Flow.

The German Navy, however, appeared to have no sea instincts. Really, naval operations are to a great degree governed by instinct, and instinct is a matter of heredity. Nothing was more clearly shown by Germany's general attitude than that her ideas were military rather than naval. Ashore, war is a science, and a great deal more of an exact science than at sea—reconnaissance, intelligence, information, and other hard facts can govern dispositions and attacks on land. At sea, conditions are always in a state of flux. Speed of

movement, difficulties of obtaining accurate knowledge, varying weather and sea conditions, make it essential to act merely on surmise—always ready to find that the conditions have changed from those which were expected.

The one marked characteristic of the enemy was his disinclination to lose a vessel. Now, in every naval engagement or undertaking, vessels are more or less certain to be lost. The only critical test of a projected undertaking is whether the object to be gained justifies the probable loss. Ashore, the enemy never hesitated to lose men; but at sea he would not risk a vessel, with the result that he educated his officers to run away. This not improbably was due to the military instinct of hating to lose *matériel*. “Saving the guns” has always been a tradition among armies. This principle applied to sea-fighting would be apt to lead to a feeling of disgrace in losing ships, and the German Navy was really governed by military and not by naval tradition. Several opportunities occurred when the Germans could have snatched a considerable success from us in the south at really insignificant risk, yet no attempt did they ever make except with the main underlying intention of getting their vessels safely back to port. At first, this feature upset all calculations; at last, it became quite annoying. But it was in reality the salvation of our shipping. Truly, we all longed to change places with him and play the game over again with our 6th Flotilla and Commodore Tyrwhitt’s splendid flotillas—Ostend, Zeebrugge, and Bruges serving as bases. The Downs, with its shipping, the cross-Channel transports, the shipping routes on both coasts, with Dunkirk, Calais and Boulogne inviting blocking operations—such an array of targets appeared to us to be a gluttonous surfeit. We ourselves, on the contrary, had nothing as an objective, since, for reasons that will be explained later, it was not advisable for military reasons to block Ostend and Zeebrugge.

Now the strategical position at Dover was one of interest, but of considerable difficulty to the Admiral. The waters of

the Dover Patrol extended from the Scheldt to the North Foreland, and from Beachy Head due south to the French coast (as is shown in the accompanying map). It formed a water area of about 4,000 square miles in extent. The vital front that had to be protected every night was fifty-five miles long, with Nieuport and the Allied lines on the extreme right, Dunkirk, then twenty miles of trade route to Calais, then twenty miles of the mouth of the Channel, down which commerce raiders or destroyers might pass, then, on the extreme left, the Downs, with their north and south entrances, between which eighty to a hundred ships lay at anchor day and night—an attack on them being only a matter of two hours' full speed steaming in a destroyer. Ostend and Zeebrugge were only sixty-two and seventy-two miles respectively from Dover Harbour, the nearest point to the English coast, and Dunkirk only twenty-three miles from Ostend.

The Downs had been selected as the examination ground for all vessels passing either up or down Channel. About 120 ships passed Dover daily in 1915 and 1916, and between 80 and 100 per day in 1917. Therefore a similar number anchored daily in the Downs. Had the Channel traffic been suspended, or even largely reduced, London would have starved, and at least one-third of its population would have had to be removed immediately to the west coast of England, since the railways would have been quite unable to deal with the food-trains that would have been required to make up for the loss of sea transport. The traffic to and from Dunkirk had to be maintained, as this port was the main feeding base of the northern parts of the British and French Armies.

There were, therefore, three main vulnerable objectives for the enemy desiring to strike at our shipping. The Downs, the trade route near the English coast, and the trade route near the French coast, the latter including the twenty-three-mile stretch of coast trade between Calais and Dunkirk, which was flanked for the whole distance by the open North Sea. In addition, the Straits had to be defended to stop raiders

passing down Channel to the Atlantic. Submarines had to be stopped when possible, and the coasts guarded against vessels raiding with gun-fire. Furthermore, the left flank of the Allied Army had to be defended against sea attack, and especially against a force landed behind our advanced lines ; and it must be remembered that the Downs and the left of our Army on the coast were fifty miles distant from each other. Incidentally, such operations as were possible to assist our troops in an advance on the coast had to be undertaken if required, every endeavour being made to attract the attention of the enemy by feinted landings in order to glue enemy troops to the Belgian coast when an offensive was initiated further south ; and, finally, such operations carried out against Ostend and Zeebrugge and the waters in the offing of the coast as would incommodate those places and make them unsuitable for bases.

In order to understand thoroughly the difficulties of the position, it must be appreciated that the "initiative" lay entirely in the hands of the Germans—that is, it was open to them to attack any objective any day or night that suited them with the whole, or such part of their forces as they might wish ; whereas we, having these objectives to defend, and none to attack, had so to dispose our available forces as constantly to guard the whole of the most vital of the objectives. Naturally, to safeguard all our interests, the force at Dover should have been a large one. As a matter of fact, it was phenomenally small. For purely defensive work as distinct from such vessels as might have been lent for offensive operations against the enemy's coast, we had, during the whole of 1915, and the greater part of 1916, only twenty-four destroyers, six only of which mounted 4-inch guns, the remainder being armed with 12-pounders. What with refits, not more than three-quarters of these were present at any one time in the Patrol, so that, allowing for the necessary rest of the officers and crews, only three 4-inch boats and six 12-pounder boats were available at any one time on patrol ; and, taking breakdowns and losses into account, even that number was rarely available.

At the end of 1916 and in 1917 these numbers were increased by a few destroyers, and an occasional division of five or six good 4-inch boats lent from Harwich. Against us, at Bruges and Ostend, there were constantly as many as from twelve to twenty-two large enemy boats, each mounting three 4-inch guns. On one memorable occasion, owing to collision and minings, our 4-inch force of destroyers in the Dover Patrol was reduced to one single boat, the *Amazon*, and I had to make dummy signals by wireless telegraphy to the boats that were absent in order to make the enemy believe we still had a few destroyers in the Straits.

The principle I always acted on was to represent our position to the Admiralty and leave to them the question of sending additional destroyers. They, with full knowledge of the whole requirements of the Navy, knew what they could or could not spare in the way of destroyers from other work, and it was my business to do the best I could with such forces as I had and not to grumble ; but it was onerous work, since, in case of the enemy carrying out operations successfully against us, it would have been impossible to explain to the British public that we had about one-eighth of the least force reasonable for the defence of the Straits, since that piece of information would have been invaluable to the enemy. The position was therefore, from the point of view of the Admiral, not an enviable one, since we never were in a position to guard all services and localities ; but, at the same time, it was more exhilarating to eke out such forces as might be available and feel that much was being done without the Dover Patrol denuding the other naval requirements of the country and weakening the protection necessary for the other main arteries of our shipping.

In arranging the strategical distribution of the defence, it was, in the first place, necessary to decide which were the most vital of our interests. Two predominated over all others—our shipping, and the holding the Straits against raiders trying to slip through. The stopping of submarines was best effected with auxiliary craft and standing obstructions. The possi-

bility of the enemy landing on the French coast could be met, though feebly, by our monitors ; while we could not ignore the possibility of night-raids by destroyers firing blindly at the coast. The damage caused by such raids was bound to be so microscopic compared with a serious attack on our shipping that it was not too much to expect that our civil population would endure such trials with fortitude and patience, supported by the knowledge that, after all, since the country was at war, they must expect some chance encounters with the enemy. Doubtless much of the bitter criticism of the Dover Patrol would have been silenced if it had been possible to explain the disposition of our slender forces ; but, of course, that was impossible. The Germans would have liked nothing better.

The ideal method of disposing the British forces would have been to have a close blockade of Ostend and Zeebrugge by night as well as by day. This was impracticable, for the following reasons. By day, no destroyers could, in clear weather, approach within 16,000 yards of the coast, since, if they had done so, they would undoubtedly have been sunk by gunfire. By night, a blockading force could not approach within 8,000 yards for the same reason, and it would also have been exposed to destroyer and submarine attack from the vessels based on the harbours. A number of blockading vessels, at least equal to the number of enemy boats inside, would, therefore, have had to be kept off each harbour. This number would have been far less than that required for complete success, since in operating off an enemy's port a distinctly superior force is necessary in order to protect and tow away vessels disabled in an engagement, otherwise these must become, in daylight, the property of the enemy. If the enemy had twenty boats, inside the two harbours, at least thirty boats would have been required in the blockading force. A relief force equal in number would have been necessary, and 25 per cent. more to allow for boiler cleanings, refits, and casualties would have been absolutely essential to maintain

this number on patrol. Hence a total of seventy-five 4-inch destroyers would have been necessary in the Dover command to keep up a constant night patrol five miles from the enemy's ports. As a matter of fact, we had only five, on special occasions increased to thirteen by loan from Harwich.

Supposing, however, these boats to have been available, there would still have been the possibility, nay probability, that the Patrol would have been evaded in the darkness, by the enemy slipping past them up the Dutch coast, or by keeping inshore and striking out to sea at some spot intermediate between Ostend and Zeebrugge. Take the simplest case : four small German destroyers, of which there were a dozen on the coast, could have slipped out close to the shore, and, by firing, attracted the attention of the Patrol ; or some six large boats could have made a feint attack on the Patrol to the westward, while a dozen large boats struck along the coast and out to sea from Blankenburgh. The first news of these would have been their arrival in the Downs, when, before the destroyers, resting and oiling at Dover, could have engaged them, they would have done considerable damage to the shipping and have passed the North Goodwin and have been lost in the open sea. These could either have returned via the neutral waters to Zeebrugge, or via Nieuport along the coast to Ostend, or dashed in at any spot along this thirty-five mile base line. With a dark night, and a visibility of but half a mile, they would have had all the chances in their favour. A blockade at night, therefore, five miles from the coast, when applied against modern fast vessels, is a fiction and a farce. The destroyers necessary for it were not available, and, if they had been, it would have been attended by so much danger, and at the same time have been so inefficient, that it would have been lunacy to have attempted it.

The strategical disposition of the Dover force at night was, therefore, one of defence, and was arranged with the following points in view :

- (1) Defence of the shipping in the Downs.
- (2) Prevention of raiders breaking through unobserved.

(3) Support of our anti-submarine look-outs and the destruction of submarines.

To effect this, the cross-Channel transports were run entirely by day and coaled and rested at night. The Channel traffic was passed close up each shore, so that each line had one flank only to be protected.

These arrangements cleared the way for the three main objects of the defence. The main difficulty in disposing our destroyer force lay in the balance of opposing requirements. To fight the German destroyers, the boats should have been concentrated, say, in a single division of 4-inch boats ; but to detect, follow, and hang on to the skirts of enemy destroyers or raiders proceeding down Channel they should have been separated and spread across the Channel in order to be somewhere near the smaller, slower look-out vessels that might have sighted an intruder, enabling the enemy to be instantly picked up and kept in sight.

Of course, the whole matter was bound to be one largely of luck. A glance at the diagram (p. 57) will show this. The black mass is the water space of the entrance of the Channel. The white circles and ellipses show the areas visible at any one time to our patrols on a dark night. The patrols shown are those available in 1917 during our most palmy times as regards destroyers, when we had a maximum number of these vessels. There were, however, several guiding principles. These were : Always to have a force actually in the Downs, where the greatest number of merchant ships lay, so that no time was lost in getting there. The chances were that four boats on the spot could engage and delay eight of the enemy, and so hamper them (even if they themselves were sunk), as to prevent much damage to the shipping till assistance arrived. Under no condition of attack elsewhere were these boats allowed to leave the Downs, as such an attack might be merely a feint to entice them away and leave the shipping open to attack. A division of flotilla-leaders or good boats, at the most two flotilla-leaders or four large boats, patrolled off the

South Goodwin ready to support either the Downs or the Channel Patrol. And a cross-Channel patrol of four boats was maintained between Dover and Calais, with a patrol in the vicinity of Folkestone.



THE CIRCULAR WHITE PATCHES REPRESENT THE AREA VISIBLE TO A SINGLE BOAT. THE ELLIPSES THE AREA VISIBLE TO A DIVISION OF FOUR BOATS.

It was only as late as 1917, and then only very rarely, that such a patrol could be maintained, our numbers very seldom allowing it, even when all the boats resting turned out, for the four or five dangerous hours of the tide, *i.e.* when the tide was running strongly and the static defences less dangerous.

In the early years four Tribal class destroyers and two 30-knotters held and patrolled the Straits against all contingencies, the remaining small destroyers assisting the shipping on the trade routes.

It will be seen that the task of defending every point was therefore impossible. The Downs anchorage was guarded jealously the whole war—over 100,000 vessels passed the Downs during 1915-17—and only one vessel was ever subjected to attack between the Goodwins and the coast, and that one had anchored in an exposed and prohibited anchorage. When raids did come, and nothing material was achieved by the enemy, it was to those who knew a matter for sincere congratulation in that the Narrow Waters had been held for two or three years, without any significant losses, by a force largely inferior to that which the enemy was able to bring. Instead of being congratulated, however, the Patrol, and especially the Admiral, was marked out for abuse. It was somewhat ludicrous to us, knowing, as we and the Admiralty did, the very slender screen between us and a disaster of great magnitude, and the unremitting vigilance that was required on the part of all to avert this.

Later on the subject will be dealt with more fully, and more details given of the patrols, the magnificent work done by the vessels, and the sacrifices that were incurred in defending the Narrow Seas and their shipping for three long years, summer and winter, day and night, gale and fog, always in inferior force, always superior in courage, endurance, and tenacity. Here the strategy of the disposition of the Channel force can be left.

The function of the Navy, however, as a force protecting the left flank of the Army, deserves detailed consideration.

A great danger lay in the landing of a large force of the enemy between La Panne and Nieuport. The Allied lines passed practically through the east outskirts of Nieuport and cut the sea about a quarter of a mile to the eastward of the Nieuport Canal entrance. If a force had been landed some three

miles to the westward of this line, between it and Dunkirk, the whole of the guns of the French defences would have been taken in rear. A frontal attack at Nieuport at the same time could only have had one ending—namely, the Allied defences being pinched through and road communication established with the landed force. The enemy could then have advanced, taking the left of the line in rear, and, pivoting on Dunkirk, established his left as near as possible to Ypres. The coast right up to Calais might have fallen, as it was merely a case of which side could rush up troops the quicker.

Such a landing scheme was perfectly feasible, indeed it was almost identical in principle with, but far easier in detail than, the scheme so nearly carried out by us in 1917. The essentials were for the enemy to build in Germany 300 flat-bottomed barges of special design propelled by petrol engines, each carrying about 200 men. Three hundred such boats would have carried 60,000 men. These could have practised embarking and disembarking on inland waters in Germany, and gradually passed, free of all observation, up to the Flanders canals, their transport eventually moving up by road to the coast. On any suitable day, when it was too cloudy for air observation, the barges could have been passed into Ostend, and, leaving at night by divisions, have covered the eight miles between that point and the landing-place. They would have had to go at only five knots speed for two hours. The barges would have been stranded over a mile front. The great feature of such an attack would have been that no subsequent sea communication was necessary, as the nip through the line at Nieuport would at once have opened up road communication. A scheme of such a nature was possible and deadly, since no warning would have been given, and few steps could have been taken to frustrate it before the actual alarm was given. This possibility necessitated our having some force always on the spot to take instant action—not that any force that we could have kept available could have prevented a sudden dash, but with even a small force it

would have been possible to create confusion and delay the operation.

A monitor, with one 30-knotter as escort, therefore, was at anchor off La Panne every night when the sea rendered a landing possible, supported, when circumstances permitted, by a division of the barrage destroyers nine miles off at Dunkirk. The monitor's orders were to beach if torpedoed, and become a fort to punish the landing force. The destroyers were to charge right into the barges, not paying any attention to enemy destroyers, but to ram, sink, and bombard the craft carrying troops. A monitor and a 30-knotter, night after night for two years, anchored within fifteen miles of Ostend on the open coast without once being molested. My chief fear was not so much torpedo attack, since the bulges of the monitor were some protection, but a deliberate boarding from a fast, armed merchant vessel. It would have been a delightful cutting-out expedition to have attempted, and might well have succeeded, considering the small numbers of the crew in a monitor and the element of surprise. The risk on our part was thus considerable, but it had to be taken.

The coast to the westward of Dunkirk was not so liable to attack, since the distance from Nieuport was too great. It would have meant landing guns and transport on the beach. I had no fears for this portion of the coast unless Dunkirk were taken by the enemy.

In case of an advance of the Allied troops in Belgium, the only assistance the monitors could afford was by firing on places where the enemy's reserves might be collected. A monitor force at Dunkirk was always ready to assist in this manner in case of attack by the enemy. Generally speaking, the old short 12-inch guns of the monitors were too inaccurate to knock out individual guns ashore; their chief value lay in bombarding areas.

In 1916, and again in 1917, a day-patrol was kept up off the Belgian coast only twelve miles from Ostend and the coast. This will be more fully dealt with later, but strategically it

was of considerable importance, since it denied the whole of the offing of the coast to the enemy in day-time except the strip of territorial water near the Dutch coast. The whole length of the patrol line was flanked with mine-nets and mines, so that a formidable barrage extended from Dunkirk to the territorial Dutch waters, as may be seen clearly in the general chart of the Patrol. In 1916 this barred the egress of mine-laying submarines to the south-east, and for five months completely stopped the mining on the English side of the Channel; whereas, before it was put in force, mine-fields were laid at the rate of one every four days. After it was installed not one mine-field was laid on the English coast in the Channel for five months. Winter broke up the patrol, and mining started again. In 1917 the barrage had not the same effect, probably because the radius of action of the mine-laying submarines had been increased, and they sneaked out up the Dutch coast, but our mine-fields laid near that coast blew up several of the German destroyers in the last four months of 1917.

The value of the patrol line was considerable, as it enabled us to place and maintain buoys at definite geographical localities along the whole length of the coast. These were invaluable as jumping-off spots for operations. Moreover, on every suitable day in 1917, firing was undertaken against Ostend and Zeebrugge without warning being given to the enemy. Alas, the weather often prevented this being successfully done, but Ostend was abandoned as a naval base after July 1917, entirely as a result of the bombardments. This was fully supported by photographic evidence, as after this date no vessel was ever seen inside Ostend harbour.

An enemy attack on Dunkirk, Calais, or Boulogne, with a view to blocking the harbour to prevent the passage of merchant vessels, was also a strategical possibility. Dunkirk lying so close to Ostend, absolutely invited such an attack, especially during 1915 and the early part of 1916 before the night entry of merchant vessels into this port was stopped.

Although the offing of the port was largely flanked by shoals, still at high water there was at least eighteen feet everywhere—quite enough to give passage to a blocking ship. The most amateur blocking would have sufficed to close the port to merchant traffic. It was the same with Calais. The defence against this form of attack will be detailed later. As regards Boulogne, the blocking of the port would have required far more adventure, and it was considered reasonably safe. This also applied to Dover itself. A genius in command at Ostend would probably have attempted blocking both entrances to Dover Harbour simultaneously; it was feasible in misty weather, and will be more fully discussed later on.

Attack by gun-fire on our coasts had to be dealt with by local batteries. Too many other interests were at stake to waste destroyers in defence. But what a valuable asset the enemy possessed if he had used such attacks to draw off our patrols from the real objective! British naval officers for generations to come will mournfully regret, and the shades of naval officers of past ages will moan over the thought, that possibilities such as were presented to the Germans fell to their Navy and not to our own.

Another operation of strategical interest was the task that fell to the Patrol of keeping enemy troops on the Belgian coast during the first days of a push down south. The extreme difficulty in carrying this out lay in making the enemy believe that we really intended landing, since obviously a landing should be a secret, swift blow without apparent preparation, whereas, to make certain that he had apprehensions, we had to exhibit our preparations in a more or less glaring way. This will be dealt with later, but one incident may be recorded to show the spirit of the Patrol. To give the enemy a fright during one such period, and to give a wakeful night to several thousand men, I sent Commander Evans of the *Viking* with two small torpedo-boats off Ostend to fire two bouquets of a hundred rockets each to give the military command something to think about; at the same time I cheered

him up by telling him that the *Viking*, his boat, was too valuable to risk, therefore the torpedo-boats were more suitable. Of course, the real reason was that at high water the shallow draught torpedo-boats were immune against mines.¹ All went well until the boats turned and made for home; then his companion boat broke down and could only steam thirteen knots. The other reduced speed and kept company, almost at once receiving a signal from the one astern to say that they were being followed by four large destroyers. Having a torpedo armament, and it being impossible to run away without leaving the rear-boat, the signal was made to prepare to engage the enemy with torpedoes. Offence being in this case the surest defence, the leader turned to engage, but discovered it was Ostend piers and their red lights that had been magnified, looming through the dim smoke of the funnels, to look like destroyers. Immediately the leader again turned to the old course and Evans said to the Sub-Lieutenant: "Signal T.G." "What is T.G.?" said the mystified sub. "Thank God," said Evans.

The one great thing we hoped for was an advance by our troops on the Belgian coast. By ourselves we of the Patrol could do nothing towards taking and holding the ports. Moreover, to any thinker the Flanders coast was the only strip of territory that the enemy had in his possession which was of direct and vital interest to this country. If the war had ended and peace ensued with this in the possession of Germany, Great Britain would have been in a position which many wars in the past had been fought to avoid. With Flanders German territory, Holland would have been isolated from the Continent, to fall like a ripe plum into the lap of Germany. The whole coast from Wilhelmshaven to Nieuport would then have been German territory. For this reason every endeavour was made to

¹ The mines were moored to the bottom of the sea by ropes. As the tide rose and fell, so the water above the mines increased or diminished. If no mines were visible at low water they were bound to have the full rise of the tide over them at high water, in this case fourteen feet

facilitate an advance by our Army should it take place. Heavy guns were transported by us from England to the Front and special arrangements for landing on the coast perfected, but our expectancy suffered severe rebuffs.

A raid by the enemy's large cruisers on the Channel was always a possibility. The possible objects they could have had in view were:

- (1) To cheer up the civil population of Germany.
- (2) To encourage our pessimists.
- (3) To raid our shipping.
- (4) To damage Folkestone and Boulogne.
- (5) To damage Dover.

For the German cruisers a raid on the Straits of Dover was an easy matter. There was nothing material to prevent their doing so. But they would have to consider how they would get back. It was the difficulty of getting back that was the great deterrent to an operation of this sort. The damage they could do was considerable only from the sea transport point of view. Assume the raid planned one week before a German offensive on the West Front. Calais and Boulogne might be blocked, and Folkestone disorganised just at the time when the crossing of considerable numbers of troops and ammunition might be desirable. For getting back, they would try either (1) to risk fetching Ostend and slipping back north on some subsequent night in the dark, or (2) to go west, disperse, and get back north about.

Against such a raid we had practically no defence. The mine-field¹ was at all events but a chance, since fast sweepers could have cleared a channel through it. Submarines were of little use against 25-knot ships. Destroyers were only of use at night, or to keep track of the ships in the day-time. The defence of the ports of Boulogne and Calais against blockading was best undertaken by submarines, who should have sunk the blockships prematurely. Dover could be annoyed, but it is doubtful if any real military damage could have been done to

¹ The large mine-field laid to eastward of the Straits in 1914.

it—bar blocking the entrances—a difficult, if not impossible thing to do thoroughly in a hurry, but one that, if even half done, would have caused considerable annoyance.

The force required for such a raid would not have been large. Speed was the great essential. Fast liners, one to block each port, one fast armoured cruiser to keep off small cruisers, two small cruisers and a division of destroyers to deal with submarines would have been ample. The whole operation would have been comparatively simple. The procedure would have been as follows: 320 miles at 20 knots would have meant a journey of 16 hours. Leave the Elbe at 1 p.m., pass via North Hinder, and, with sweepers ahead, keep to the east edge of the mine-field. At 5 a.m. arrive off Calais. Drop one blocking ship, which would simply steam straight in and blow herself up in the entrance. Reach Boulogne at 6 a.m., drop another vessel to behave similarly. Arrive at Folkestone at daylight, smash up the station and railway-line on the pier. By noon the enemy could have been well over on the French side, going down the Channel, making for the Atlantic, to disperse, then making his way home north about.

Or another procedure would have been to strike Boulogne and Folkestone at daybreak, then Calais, and shell Dover, and then proceed back by the east edge of the mine-field to the Elbe, leaving the destroyers at Ostend and Zeebrugge. Whether such a dash would have been worth the risk it is impossible to say. I think it would have been, since the loss risked was not really material to the Germans, whereas success tastefully embellished would have raised the spirits of the Teutons and reduced our prestige in the eyes of wavering Allies and neutrals.

In the attempt to prevent such a raid, I proposed:

(1) A mine-field five miles long, from the East Dyck Bank over the Bergen Bank in a W. by N. direction. This was to close the passage of the West Hinder, and inside and outside the Inner Ruytingen to a vessel passing to the southward.

(2) Reinforce the northern line of mines by three lines of groups.

(3) The Dover Destroyer Flotilla would, with a Harwich Flotilla, place themselves in a position to attack the cruiser *on her way back* if she passed to the eastward again.

(4) The submarines would do their best to sink her.

(5) Any fast destroyers to the west would prepare to attack, keeping in touch during day-time if possible.

Of course the Grand Fleet Cruiser Squadrons were to keep the northern passage guarded, and the patrols in the Channel to the westward should have been able to give warning if the cruiser had tried to dash back on a subsequent night. It will be observed that there was but a very shadowy chance of preventing such a raid, except through a lucky mine or a fortunate submarine. We could prevent a cruiser *staying* and doing a maximum amount of damage, by the use of monitors (if available) and submarines. But our real function after this was to catch the cruiser on the way back, and thus take the sting out of the raid.

The real remedy was to have one or more large cruisers always in the Middle Deep¹ or Dover. Any one can run round a corner and throw a stone at his neighbour's windows with a good chance of breaking them; but he does not score much if he is caught when running away.

It is interesting to speculate how far a Channel Tunnel would have assisted this country during the war. In the first place, had the Channel Tunnel existed, we should in all probability have lost the war, since the Germans would undoubtedly have secured the French end before going south towards Paris. In the early months of the war they would have considered this a primary objective. At this time the whole coast had been evacuated by us as far west as Havre. Had the Germans made good and held some line from Albert to Abbeville and the coast, their line would have been shortened and the whole of the north coast of France and the French coast of the

¹ An anchorage in the entrance of the Thames.

Narrows would have been in their possession. This would have been a most serious, in fact almost fatal, handicap to us.

If the Germans, then, had not disregarded the absolutely obvious strategy at sea, the Thames traffic would have been impossible, and our communication with France not only robbed of the ports of Havre, Treport, Boulogne, Calais, and Dunkirk, but enemy submarines could have worked from bases close to the Cherbourg and Brest transport routes.

Our reply must have been the blocking of Calais, Dunkirk, and Boulogne, and increasing the Channel destroyer force, thereby handicapping the Grand Fleet. Dover would still have been important as a base for operating against enemy submarines, but the value of Portsmouth would have been largely increased. The French coast, instead of the Belgian coast would have bristled with German batteries. It may, of course, be argued that if Calais, Dunkirk, and Boulogne were blocked the coast would not have been of much use to the enemy; but this is not the case. Blockings, as explained later, are only a very temporary expedient.

With the military situation I am not competent to deal, but it appears to me that the Channel Tunnel would have necessitated the occupation by the French of their end in order to destroy it in case of necessity. This would undoubtedly have been protected by batteries and a permanent garrison. To reduce this would have meant delay to the Germans on the Paris march, and probably an entire change in the strategy of the advance, which might have had a far-reaching effect on the first phase of the war, by causing less hurry and holding the country as the troops advanced. In any case the Tunnel would have been destroyed, and therefore useless during the war. This is not written in any way as an argument against the Tunnel, as the above remarks do not apply to a future war, since it is inconceivable that any country could again go to war as Germany did in the late one, without any regard to the value of the proper use of sea-power. But, so far as the late war is concerned, I am glad

the Tunnel was not in existence. Our Army was never short of either munitions or food, the cross-Channel losses were negligible, and, beyond providing a more comfortable route for some of the poorer class of sailors, it would only, had it survived, have released a limited amount of shipping, and that is the most it would have done.

Now that the various functions of the Dover Patrol have been sketched out, it is well to emphasise again the feature which intensified all our difficulties, namely, that boats could be despatched with considerable secrecy from Wilhelmshaven to the Belgian coast during a single night so that any morning might bring an accession of force preponderatingly greater than ours. This especially applied to our defensive work in the Channel, and to our force on the Patrol line off the Belgian coast, which, in the early morning, might have been rushed by unexpected numbers. Only once was this attempted, and then only half-heartedly, and it failed owing to the Patrol having rigidly complied with the orders issued to keep together; but the menace was ever present.

The two factors that handicapped our work both in the Channel and also on the coast were, first, the want of good mines that were really dangerous to submarines, and, secondly, the lack of destroyers. It is easy to blame pre-war administrations for these deficiencies, but to do so is not fair. No one foresaw the peculiar conditions of sea-warfare that would be forced on us, as no one foresaw the vast supply of munitions that proved to be necessary on land. Had a dozen thinking naval officers been asked if Dover would be a base of great importance in a war with Germany, the majority would unhesitatingly have said "No." Of moderate importance? "Yes." But not for one instant would it have been given the place as that of second importance to the Grand Fleet in the naval commands in home waters. The reasons are not far to seek. First, the military occupation and retention of Belgium was never anticipated. Trench warfare, such as we have seen it, which caused all land advance to fail for three

years, has been a revelation. The stagnation of military advance on either side was undreamed of. It was, therefore, never anticipated that the Germans could hold the Belgian coast long enough to establish and protect with heavy batteries naval bases of considerable magnitude, and thereby flank our East Coast trade route, and threaten the Channel at close quarters.¹

Again, submarine warfare, wholesale and indiscriminate, was forecasted, but rejected by most as improbable on account of incurring the enmity of neutrals; moreover, such warfare carried out from the German ports was a far simpler problem to tackle than when these boats were based on Ostend and Zeebrugge.

It must be remembered that the national purse in peace-time has to be drawn on in moderation for naval preparations, and that all increase in ships and vessels has to be defended in Parliament on the score of necessity. No one was gifted with sufficient prophetic insight in the years before the war to adumbrate the conditions that arose in 1915 and 1916, with their accompanying heavy demand for destroyers.

Wisely the Admiralty devoted their annual grant largely to the provision of battleships and cruisers, and by so doing saved the country. Destroyers were improved and built in numbers sufficient for the needs that were foreseen, and perhaps the margin was run a bit fine; but who could have defended the expenditure in peace-time of another £30,000,000 on destroyers? With mines it was a different matter; our mines were designed for use against ships; their use as an anti-submarine defence was not anticipated. They were fairly efficient for the purpose for which they were intended, but still the Germans had a far better mine. This was primarily due to the deep-rooted objection in the Navy to the use of electricity in contact mines, if it were possible to avoid it, owing to the trouble usually met with from weak batteries, bad contacts, etc., and one

¹ Never in the history of the world has a fortified shore base been taken by a naval force without military assistance.

condition laid down in evolving our mine was that electricity was not admissible in its design. We always preferred a mechanical firing device to an electrical one, and therefore, because of prejudice, rejected a thoroughly efficient weapon and adopted an inferior one.

In 1916 I urged the use of mine barrages both in the Dover Straits and also in the North Sea ; that is, a vertical wall of mines with the mines at different depths, so that a submarine passing submerged through an area ran a chance of striking a mine at whatever depth it ran. But the mines then existing were of little value, and, if laid in the best positions for the purpose, would have blocked those positions for subsequent use when the new pattern was ready. There was no objection to laying the old pattern mines from the Goodwins to the Ruytingen to reinforce the net barrage, which we did ; but the Folkestone-Grisnez line was reserved for the new mines when they should become available.

There was only one means of preventing submarines passing the Straits : namely, by a mine-field of fourteen lines of mines at seven different depths, each line being duplicated, so as to double the number of mines at each depth. Submarines could dive off the Goodwin and run at twenty fathoms right down well past the Folkestone-Boulogne line ; there was nothing to reveal their presence, and no means of stopping them—bar mines. It was the barrage planned in February 1917 by us that eventually stopped them. The mines for this barrage could not be supplied till November 1917, and were almost completely laid by December 31st, 1917. My Chief of the Staff, Captain Evans, was left behind with the new Admiral to complete such mine-laying as was not finished. Had these mines been supplied in February all submarines would have been stopped passing through the Straits in the summer of 1917.

It will be seen from the above that the Dover Patrol was no command for an Admiral who valued his contemporary reputation as distinct from the reputation history might

subsequently assign him. Strategically at an immense disadvantage, tactically he was largely inferior in force. It was the only naval command daily and nightly in close touch with the enemy. It had vast interests to defend, of which only the defence of the more important could be attempted with the force available. Any night the enemy could, after secret preparations, have swept the whole Dover Force off the face of the sea ; the number of vessels required to prevent this was so large, so impossibly large, that the risk had to be accepted. At the same time, so urgently were destroyers required for other duties that the least number possible to defend the really vital interests of the Straits had smilingly to be accepted. Not a word, not a whisper of our inferior numbers could be allowed to escape to the Press, because this would have benefited the enemy. The result was the whole situation could not be appreciated by the country. The more the Press slated the Admiral for inefficiency, the more insistently they asked what "was the Admiral at Dover doing ?" the better, and the greater the service they were unconsciously rendering to the country. Our reply was merely, "Let them come again ; one day they will be caught and punished." This defiance was more likely to make them careful, and less likely to attempt any really great offensive which we were not in a position to defeat. In fact, bluff was the keystone of our immunity. The German was a logical thinker up to the point of viewing every action of ours in the light of what he, under similar circumstances, would have done, and not what our temperament would cause us to do, and this was his absolute undoing. This was our great asset. How could he, the military thinker, believe that the Straits of Dover at one time were held by one 4-inch destroyer while he had a dozen at the Belgian ports ? How could he detect that the boats to which wireless telegraphy signals were being made were repairing at Liverpool, Portsmouth, Southampton, and Chatham, and not in the Patrol ? How could he believe that we would institute a day blockade of the waters of

his coast within twelve miles of his ports when we had insufficient destroyers to hold the Straits? He saw the magnificent display of borrowed cruisers and destroyers on the barrage patrol line shortly after it was laid; he probably argued that these were in reserve and within reach. How could he tell that the hundred trawlers anchored off Dunkirk in 1916 were virtually unprotected, and so on? Had his temperament been to act and to argue, blindly and simply, "There's an enemy, let's go for him," which any day a new officer in command might have done, our game would have been up.

The inhabitants of the east coast of Kent grumbled at having those occasional five-minute bombardments. Only eight civilian deaths¹ were caused by destroyer raids. I much regretted this loss. As, however, important information would have been given to the enemy, it was impossible to say, "Which would you rather have, eight casualties and four houses damaged, or that the country should lose 6,000,000 pounds' worth of merchant shipping and 3,000 seamen? Moreover, I cannot protect both Folkestone and Ramsgate against lightning bombardment, as more destroyers cannot be spared for Dover, so you will in any case have to toss up with Folkestone which of the two shall be protected."

Again, I was constantly being worried by people who should have known better because submarines passed through the Straits. The answer was, "Supply me with the mines necessary and I will stop them." To the commands farther west, who did not know the waters of the Patrol, this naturally savoured more of an excuse than a reason. Events, however, justified my confident forecast that mining the Straits would stop the submarines when efficient mines were supplied to me.

So daily and nightly dispositions were made, and risks taken, with inward congratulation in the evening that nothing really untoward had happened during the day, and in the morning that our shipping had been protected during the night. With all tactical and strategical odds against us, the

Admiral had one superlative asset in the magnificent personnel, officers and men, under him. I never had one moment's doubt that, come what might, the personnel of the Patrol would slash such a scar across any enemy operations, if once in contact with him, that the Navy would emerge with glory even from the most strenuous of the enemy's offensives.

GERMAN STRATEGY

You thought to win by trickery and by methods underhand.
The teachings of sound strategy you could never understand.
We filled all the seas with commerce, our fleet held yours fast at bay.
You might have waged a gallant war ; but you chose the other way !

For you never learned the lesson that sea war has always taught,
That alone by losing vessels sea supremacy is bought.
Every nation that has striven has paid down in full the fee,
By unstinted loss of war-ships, for the mastery of the sea.

Then you thought to win against us by the bogey of the raid.
Did you think that such futilities would make our breed afraid?
Did you think you'd break the morale of our mercantile marine,
That you'd keep them cowed in harbour by your mine and submarine ?

Had you kept our Grand Fleet busy, had you swept the Channel bare,
Had you flooded distant oceans with your raider and corsair,
Had you not embarked on murder, had you kept within the rules,
You'd have stood a chance of winning and been neither knaves nor fools.

Had you stirred your sailors' courage, had you taught them to believe
That what had been done by others they could equally achieve,
Then the world's brave deeds your seamen would have striven to transcend,
And have saved the vile dishonour of your Navy's bitter end.

CHAPTER IV

COASTAL BOMBARDMENTS

Remarks on modern bombardments—Observation of fire—Early long-range firing trials—Observation tripod—The grid—Arrival of the 12-inch monitors—Exact facsimile of Zeebrugge bombardment laid out on the Thames—Defence against submarines—Net-drifters—The Zareba—Firing underway—General plan for bombarding Zeebrugge—Delays—Narrow escape of the monitors—A feint of landing to keep troops on the coast—Bombardment of Middelkerke, Westende, and Zeebrugge—The loss of the *Sanda*—Bombardments during January 1916—The operation in September 1916—The arrival of the monitors *Terror* and *Erebus*—Attack on Zeebrugge and weather difficulties—The bombardment of May 12th, 1917, and its result—The bombardment on June 5th of Ostend—The attack of September 22nd–25th—Ostend abandoned as a harbour by the Germans.

IT is not of the slightest use firing guns in war-time unless the object aimed at is hit, or unless each shot fired assists in the ultimate hitting of the object. This latter qualification is necessary for the following reason. A heavy gun fired at long-range does not place each succeeding projectile in the same hole. However accurately the gun may be aimed, certain variations occur in every round. Inside the gun there are, among other variables, the exact weight and composition of the cordite charge, the exact size of the hundreds of sticks of cordite (both of these affect the burning and pressure of gas liberated), the exact weight of the projectile, and the wear of that portion of the gun where the barrel joins the cordite chamber, as well as the wear of the barrel itself. All these affect the velocity with which the projectile leaves the muzzle. Then, in leaving the muzzle, the projectile experiences an uncertain degree of unsteadiness. The wind, if variable, acts differently on succeeding rounds—the weight of the projectile

again comes in to affect its loss in velocity ; the positioning of the centre of gravity, wind, density of air, and temperature—all influence the flight. So that, broadly speaking, a gun drops its projectiles into an area the size of which depends on the nature of the gun and the range, and not on to a definite point.

The chances of hitting an object, therefore, even assuming absolutely accurate aiming, depends on the size of that object and the number of rounds fired. As an example, the mathematical chance of hitting a lock-gate at Zeebrugge from a bombarding distance, assuming absolutely accurate aiming, was once every sixty-seven rounds. Now, as aiming from a ship at sea can never be assumed to be quite accurate, the chances of hitting from such a moving platform are considerably less than the mathematical calculation. So it will be seen that sea bombardments are better carried out against areas than against definite small objectives.

Now it is quite impossible to calculate the elevation and direction that should be given to a gun at any time to hit an object. Atmospheric conditions defy accurate estimation. A projectile may well rise during its flight to a height of 30,000 feet and over. The wind, temperatures and pressures in the upper atmosphere all vary and cannot be ascertained, so that, even if the exact geometrical range is known, the guns cannot be accurately laid on an object at long range and the best results ensured. Also, since from a ship the exact range and direction of an invisible target cannot be ascertained, it is quite useless to imagine that the initial rounds of a bombardment will be more than somewhere near the target. For this reason it is necessary to observe where these initial rounds fall, and inform the vessel so that the elevation and direction of the guns can be altered to bring the target to the centre of the area, or "pattern," into which the gun is dropping its successive shots. Again, this is not all. Owing to atmospheric alterations, the shell, in a quarter or half an hour, would correspondingly gradually wander away from the target. The "spotting," as it is called, of successive rounds must be

continuous during the whole of the firing to enable the necessary corrections to be made as the atmospheric conditions vary.

In long-range bombardments, the object aimed at can rarely be seen, but generally some object, such as a church spire or chimney, is in sight. The guns can be aimed at definite angles to the right or left of this visible object, so as to drop the shell in the vicinity of the target. Such a method of aiming is called "indirect" aiming. As our protective smoke-screens developed the shore was never in sight from the firing ship ; nothing could be seen except in exactly the reverse direction to the shore. On such an occasion a ship was anchored five to eight miles away, showing a bright searchlight. This light was used in exactly a similar manner to the chimney ashore, the only difference being that the angle between the line of sight laid on the light to seaward of the ship and the direction of fire of the guns was very much larger than was the case when a shore-mark was employed.

These remarks give the skeleton of indirect firing methods, spotting the bursts, and correcting thereby the fire, using a mark clearly visible to aim on, and varying the direction of the gunfire by an angular measurement from this mark.

Now when, early in 1915, our attention was largely directed to the desirability of accurate shore bombardments, no reliable method of any sort existed for spotting bursts. The most promising was by sea-plane, but when tried in the Thames with the *Revenge* this method was merely a record of failures. The sea-planes could not receive messages ; they could only send. Hence, like talking to stone-deaf people in the dark, it was impossible to make them understand what was required. The instruments and fittings were faulty, and the machines themselves were not reliable. They could only rise from the water in more or less calm conditions, and their range of action as regards the distance that they could fly was poor. I saw that, if we were to carry out any bombardments satisfactorily that year, other methods of spotting would be necessary.

There was, of course, the old method of observing a burst

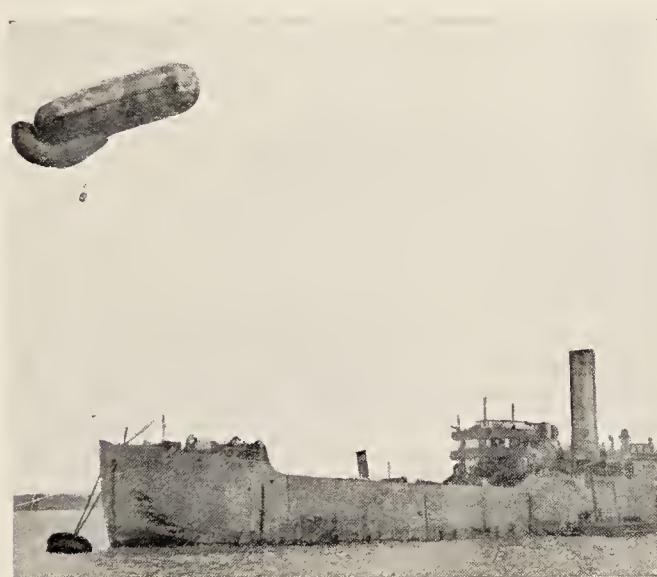
from each of two ships well apart and plotting the intersection of the two lines of bearing. This was commonly in use at the Front, where stations could be installed in or close behind our advanced lines and bursts in the enemy's area near by could be more or less accurately located ; but the accuracy of firing by this means depended on getting the two stations reasonably far apart compared to their distance from the burst. At bombarding ranges of 20,000 yards this was impracticable. How were we to get forward observing posts at sea ? Rafts were an obvious method, but these could not be fixed so that the zero-line of the observing instruments did not alter with the swing of the raft. Why not fix the raft to the bottom and make it an island ? This was the solution—so at once I set to work to design portable islands. Of course every one laughed : one of my captains resigned because he foresaw failure and disaster in such a mad proposition. But we tackled the problem seriously and produced the islands, one of which is shown on Plate VI. It was not an extensive property, but it was densely populated. The area was 6 feet 9 inches by 5 feet 4 inches. It carried two observing officers, two signalmen, and two observation instruments, with two oxy-acetylene signal-lamps and the necessary cylinders. Of course, the dimensions were cut down to the last possible inch so as to make these tripod islands as invisible as possible.

The tripod, which weighed five tons, was built of railway-rails, tied as necessary. The base was an equilateral triangle of 23-feet sides, the total height from the platform to the base being forty-four feet. Trouble was experienced at first in securing the instruments to the platform, so as to keep the zero-line steady, since "wring" and vibration were most upsetting. In the end, they were mounted on an inverted U-channel, which was supported on a central post, which post was secured well down between the tripod legs with a clearance hole through the platform. This was quite successful.

These islands—there were four of them—were carried in two coaling-yard craft—C. 64 and C. 65—and two other



SEA-PLANE, SEA-PLANE CARRIER "RIVIERA," AND MONITOR

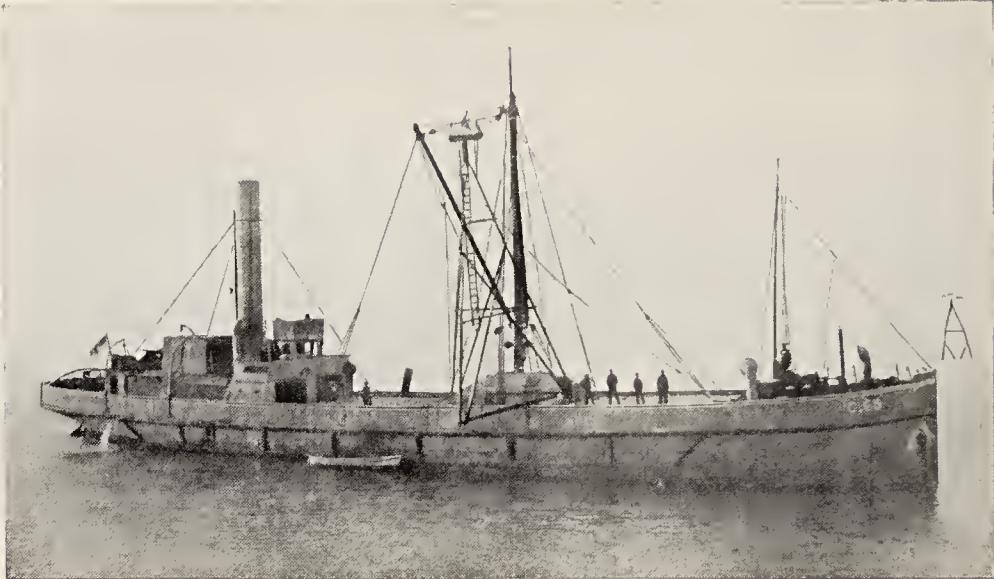


KITE-BALLOON RISING FROM "CITY OF OXFORD"
BEFORE BEING TRANSFERRED TO THE TRAWLER.



THE TRAWLER "PEARY" TOWING A KITE-BALLOON.

This was one of our innovations to avoid taking the deep draught kite-balloon ships into the dangerous waters of the Belgian coast.



"C 65" CARRYING A TRIPOD AT SEA.

This is how the islands were transported to the enemy's coast.



TRIPOD—LAID FOR SERVICE.

Tripods were small portable islands which we carried and dropped off the places we intended to bombard, so as to observe and correct the accuracy of our gun-fire.

small vessels, the *Curran* and the *Gransha* (see Plate VI). They were lifted on to the deck by winches and arranged so that they could be got over very quickly with their crews on them. The only precaution necessary was to come up head to tide, anchor, and swing to it before actually landing the tripod on the bottom ; otherwise the ship would swing over or away from the tripod in landing, and capsize its crew before the wire could be slipped. The clothing of the crew was arranged so as to make them as invisible as possible.

The sea-plane spotting was pushed on with reasonable success was obtained ; but it meant hoisting the planes out of their mother-ship, the *Riviera*, and their then rising from the water ; this could only be done if the water was fairly smooth, an unusual condition in the open sea, so no reliance could be placed on them.

The *Revenge* was sent to the Swin with the tripods to carry out firing and develop methods. The question of quick calculation of corrections for range and direction was of great importance. The principles of the method used by us when I commanded the 15-inch howitzers in France were adopted and adapted. This was called the "grid" method (see Plate VII). It really represents a large-scale plan of the area near the target. The centre is the point of reference—that is, some easily recognisable mark which both observation stations and also the ship can see. The red lines are drawn half a degree from each side of this, in the direction of, and to meet at, the left observation station. The green lines are drawn similarly for the right observation ; the position of the spot it is desired to hit is, for simplicity of description, assumed to be at the point of reference, although this is not necessarily the case. The black lines are drawn $\frac{1}{2}$ degree apart from the line joining the ship firing and the point of reference. At right angles to these latter other lines are drawn, corresponding to range differences of 100 yards—that is, they are 100 yards apart.

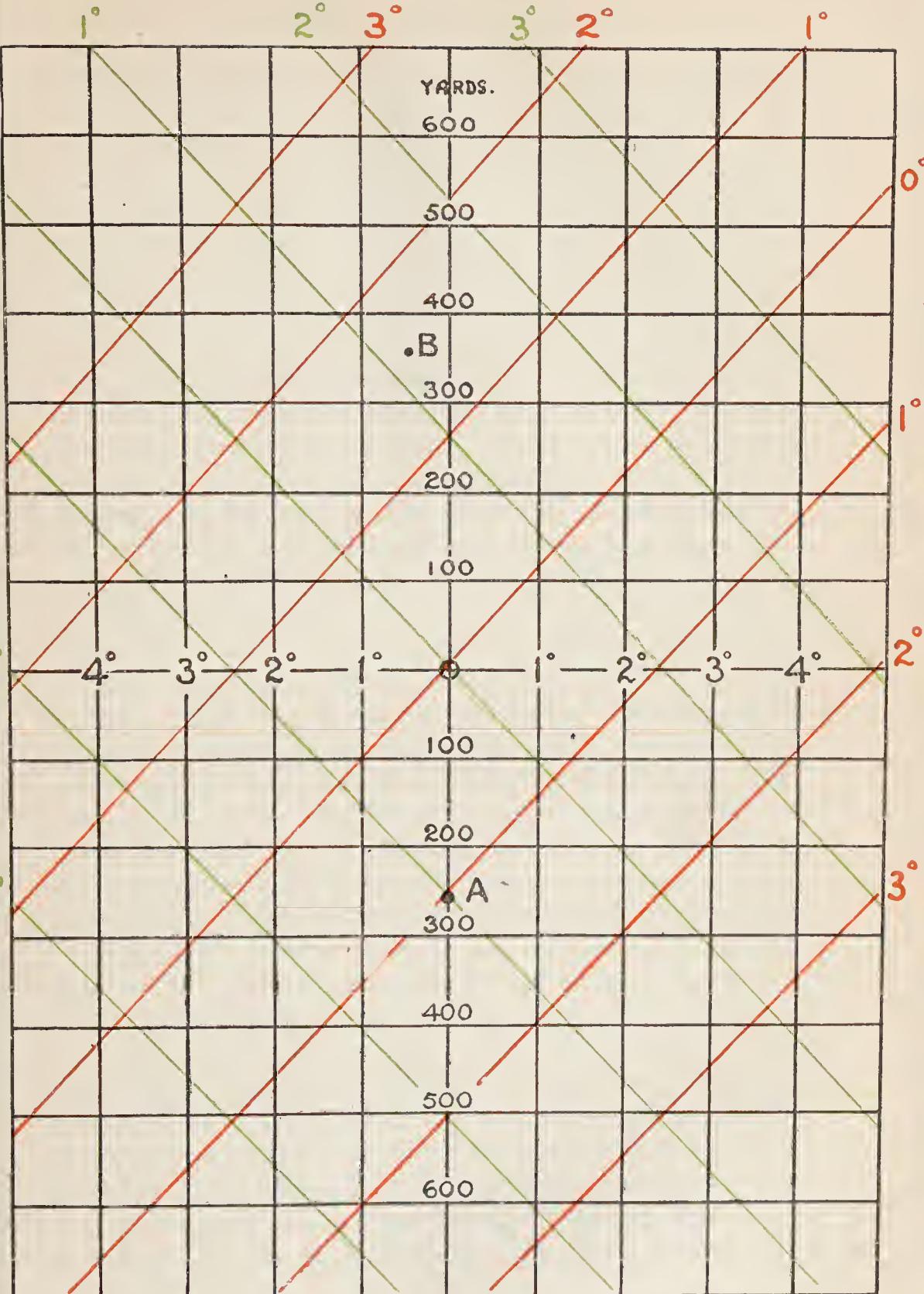
It will be seen that a report 1° right from the left station, and 1° left from the right station would mean a shell had

burst at "A." "A" is correct for direction and 280 yards short. A report from the left station of $1^{\circ}30'$ left and from the right station $1^{\circ}15'$ right would fix the shell-burst at "B." This point, it will at once be seen, is 15' left and 350 yards over. A corresponding back correction would therefore be required to hit the target. The principle of this handy little instrument, with many modifications, was used in all our firings with aeroplanes, and was really invaluable as a quick, accurate method of correcting range. One of my greatest troubles was to obtain signalling lights which could be seen for five miles in daylight in order to signal the observation from the tripods to the ships. This difficulty was at last overcome, but dozens of other small troubles cropped up and had each in turn to be settled before we were equipped in all respects.

The bombardment of Zeebrugge was put off till the arrival of the 12-inch monitors, but as soon as the *Lord Clive*, *John Moore*, and *Prince Rupert* put in an appearance they were sent to the Swin to practise the new methods, and they had a most disappointing time. Every day some pipe burst, or some portion of the turret mountings gave out. The cause of these troubles was a simple one; these ships had turrets taken from old battleships of the *Magnificent* class. Taken straight from these ships and mounted in the monitors, the copper pressure pipes, having become crystalline with age, did not stand the re-erection. New stresses during the fresh coupling-up were set up and breakdowns occurred. However, things gradually straightened out.

Now, as the monitors and most of the other vessels had never worked together, as speed in laying out the tripods and ranging was highly desirable, and as my experience, as well as that of my staff, in making out detailed orders for an extensive war operation without any ambiguity or omission, was not as great as could be desired, an exact replica of the offing and principal shore marks at Zeebrugge was laid out in the entrance of the Thames, with all compass bearings and tides which existed off Zeebrugge, and with a convenient depth of water for the

PLATE VII



GRID FOR THE CORRECTION OF GUN-FIRE.

tripods. The whole operation was rehearsed, considerable benefit being derived from this dummy bombardment.

The question of the probable protection methods of the enemy had to be thoroughly considered. In those days I knew little of the German Navy, and credited the enemy with foresight and initiative, and was quite prepared for a warm reception from their destroyers and submarines, and possibly from the shore batteries with which the Intelligence Department had credited them. It was no light undertaking to carry out a three-hour bombardment only ten miles from a submarine-infested port, with destroyers and batteries with long-range guns to support them. At all events, the matter was one which called for every precaution being taken in advance. A glance at the chart Plate VIII, where the soundings are given in feet, will show that a direct frontal attack by submarines was improbable, the Schooneveld Bank being a nasty obstruction to a submerged submarine in a cross-tide. The real danger lay in an attack from seaward. When I first started the submarine service in our Navy we carried out the first manœuvres against Admiral Sir A. Wilson's fleet under conditions not dissimilar to those with which we were now confronted; I had therefore already studied the problem from the submarine side, and the course I would have chosen would have been to send the boats either to the eastward or the westward well out to sea, according to the position of the mine-fields, and then to bring off an attack from that direction.

A screen of destroyer patrols was sufficient between the ships and the shore to look out for a periscope, but the seaward side required net protection. A zareba of nets was, therefore, arranged for. Again sceptics shrugged their shoulders at taking eighty drifters with the fleet at night, and getting them to lay nets with any sort of reasonable precision off the enemy ports; but I always had great faith in the deep-sea fisherman as a seaman in the best sense of the word—that is, a man to whom the sea is as familiar by day or night as the land. Also I had great confidence in Captain Bird, who

commanded them. What did it matter if they did bump into one another on the way over? They would not do much damage, and as a protection they were invaluable. In Chapter XV I describe what they actually did, and how they did it; and they did it thoroughly well, too. The three-sided zareba is shown close to the Schooneveld, and the method of its formation can be easily traced. This work was done by fishermen—men who, previous to their Dover training, knew nothing of sailing in company, or of taking in and obeying signals. The more I saw of the trawler and drifter folk, the more I admired their great endurance and marvellous sea adaptability. The nets were drift-nets—nine miles of mine-nets, seven miles of ordinary nets, sixteen miles in all—and the tide a clock tide¹; but, as the time for the attack was at slack water, the drift was not of great importance. The drift-nets and the destroyer patrols which flanked all four sides of the zareba, steaming at sixteen knots, formed the anti-submarine defence. Another method the enemy might have adopted to annoy us was to send mine-laying submarines to lay mines on our return course. The mine-sweepers, therefore, swept ahead on the return as well as our outward journey.

The location of the permanent mine-fields of the enemy was unknown; all the accurate information we had was that the *Maori* had been blown up off this harbour about two months before. Beyond sweeping in advance of the ships nothing else could be done. The number and size of the batteries were also not accurately known; according to reports, the enemy were credited with two 11·2-inch, one 12-inch, and forty-two 7-inch and 8-inch guns. It was, consequently, wise to keep the ships under weigh, thus presenting a moving, instead of a stationary target. Arrangements were, therefore, made for laying out two buoys for each monitor to steam between, and the position of the buoys was chosen, so that the ship, in steaming between them, was able to allow a small and known

¹ That is, a tide that varies its direction hour by hour, gradually working round the compass between successive high tides.

regular rate of change of range and bearing of the target for her own guns, but considerable variations of rate of change of range were imposed on the shore batteries as the ships steamed between the two buoys. These variations ranged from 200 yards to 1,500 yards according to the battery. I did not feel justified, since this was our first attack, and the enemy's gun defences were an unknown quantity, in anchoring the ships until I was satisfied that the vessels would not be subjected to a serious fire from the shore.

The general outline of the whole operation was as follows. The fleet assembled at different places to avoid a large concentration at one point being observed by enemy aircraft : the monitors, with the *Cossack*, *Crusader*, and *Saracen* in the Swin ; and the tripod ships, each with a drifter in tow to rescue the men on the tripods if necessary during the firing, with the destroyers *Amazon* and *Ure* at Margate, the *Viking*, *Gkurka*, *Tartar*, and *Mermaid*, at Dover. The mine-net drifters assembled two miles east of Kentish Knock, and the yacht *Sanda* and the ordinary drift-net drifters one mile east of Kentish Knock.

The times of sailing were arranged so that all should meet at the Galloper Light just before dark. The juncture of all these units was satisfactorily accomplished, and the whole fleet of about one hundred vessels of sorts steered for the North Hinder lightship. When this lightship was made,¹ course was altered by the main body for the south-west end of the Thornton Ridge. Commander H. G. L. Oliphant, with the *Amazon* and *Ure*, and the east tripod ship parted company for their position off Zeebrugge : Torpedo Boat No. 24, with Lieutenant-Commander R. Viney, had sailed to arrive five miles south-east of the North Hinder at 10 p.m., and from there altered course for the Thornton Ridge to sound and mark the S.W. and N.E. ends of that shoal with lighted buoys. Two destroyers, under Commander R. H. Coppinger, supported him. These buoys were laid to assist the two portions of the fleet in checking their positions. The reason for sending the *Amazon* so far to the

¹ Technical term for sighted, and the correct position being obtained from it.

eastward was that a mine-field was supposed to exist between the place selected for the monitors to fire from and the eastern observation tripod position. All went well except that the Thornton Ridge could not be accurately located by soundings, as the depth of water was much greater than that shown on the chart and therefore differed little from the surrounding bottom. The banks on this coast vary considerably at different times of the year. The firing positions were taken up ; the zareba of nets was run like clockwork ; the observation-stations were laid, both the laying-ships being shelled, but fortunately not hit. The firing began, and the enemy's fire all fell short. The tripods were not observed or fired on by the enemy.

Both the gun-mountings of the *John Moore* and one of the *Prince Rupert* soon gave up. Firing was continued for an hour and three-quarters by the *Lord Clive*, after which, as the tide began to make earlier than was expected, and, as only one ship was efficient, the "Cease-fire" was made ; the tripods were picked up, the nets hauled, and the squadron left. This sequence of incidents illustrates the difficulties attending such bombardments—two of the three ships being out of action through unforeseen causes.

It was difficult to ascertain at the time the exact damage done, but, according to accounts subsequently received, many of the enemy's works suffered considerably, two or more of their vessels were sunk, and they suffered severe casualties to personnel. The results were almost entirely due to the *Lord Clive*, Commander Norman Carter. The gunnery lieutenant, Lieutenant Lionel Robinson, deserves credit for the success.

Like nearly every operation on the coast, weather frustrated the first attempt. On August 21st the whole fleet had to turn back on account of the considerable sea that was met with off the Galloper. The units were dispersed at daybreak and reassembled the same night, and the bombardment came off on the morning of August 23rd, 1915.

The failure of the enemy to take any energetic action during

the bombardment was a great surprise, and to a certain extent unaccountable. Further, it was rather a disappointment, for it was hoped that one or more submarines might have been accounted for during the operation.

Pending information regarding the actual damage done, preparations were made to bombard the dockyard at Ostend. This is shown on Plate XXXVIII; the dockyard was in the centre of the harbour, with dwelling-houses for the civil population, within 300 yards on each side. These houses I was most anxious to avoid hitting, as they were inhabited by Belgians who already had suffered greatly in the war; moreover, wanton, or apparently wanton, damage would tend to affect our relations with them, and might have produced a *rapprochement* with the enemy.

The defences at Ostend, again, were not accurately known. We, however, knew that the Hindenburg Battery just to the east of the harbour mounted four 11-inch guns, with an estimated range of 16,000 yards. Several 6-inch batteries were supposed to be in existence. The arrangements were very similar to those for bombarding Zeebrugge, the drifters accompanying the ships and shooting-nets. I determined in this instance also to keep the ships under weigh, not being satisfied as to the nature of the defence.

On September 5th a start was made, but again, as in the case of the Zeebrugge attack, we had to turn back owing to the sea. The course was via Dunkirk and the Zuidcoote Pass to the east of the Smal Bank, and not the northern route I had previously used, as the enemy might be expected to be watching that approach. On the evening of the 6th another start was made, and early on the 7th we arrived within sight of the coast. It was a fine morning, but a low-lying mist had spread itself all along the shore, and by the time that we arrived at the firing-point only the spire of the cathedral was visible, and, shortly afterwards, this too disappeared.¹ There

¹ Of course, had we been Germans, the town of Ostend could have been reduced practically to pulp without a single shore gun being able to reply.

was nothing to do but to anchor and wait. An hour and a half passed, and still the mist-bank obscured everything, so, as the tide was rising and making fast, the "Re-form" was made, the nets hauled, and we stood away, proceeding down between Cliffe Island and the outer Ratel Bank, and then anchored and watched the *Redoutable* firing at the Westende batteries. On the way down we were attacked by aircraft, which unfortunately dropped one bomb on the *Attentive*, causing eight casualties. This was the only occasion when damage was caused by an aeroplane bomb to a ship under weigh, in spite of the large number of times our vessels were subjected to bombing. Early in the afternoon the mist lifted, and the shore became clearly visible. I weighed therefore, and again proceeded to Ostend. The nets were shot, and firing commenced.

The ships, in order from the eastward, were the *Lord Clive* (Flag), the *General Craufurd*, and the *Prince Rupert*. The weather was now extraordinarily clear, every house in Ostend standing out with wonderful sharpness. One enemy kite-balloon was up to the eastward of the town. A few minutes after firing commenced, heavy shell began dropping near the *General Craufurd*; salvos continued almost exactly every two minutes, until it was quite certain that one of the heavy batteries had a longer range than we expected. As I had gone within 18,000 yards, I signalled to the monitors to alter course to the northward and stand out. I proposed going to 19,500 yards, hoping that it was merely the Hindenburg Battery that had been given increased elevation. Very soon after the signal had been made the shore battery turned on to the *Lord Clive*, evidently having now made out that she was the flagship. The shell in single shots followed us up, and, after we again turned and commenced our fire, the shore battery changed once more to salvo-firing. Then followed a warm quarter of an hour. A plan of the fall of shot is given on the opposite page. This was made from notes taken by Lieutenant Keigwin, my Flag-Lieutenant. The salvo at 3.50 was a particularly warm one, one shell striking the star-

H. M. S. 'LORD CLIVE'.

3.45
P.M.

FALL OF SHELLS IN VICINITY OF VESSEL

FROM 3.26 P.M. TO 3.59 P.M. ON 7TH. SEPT '15

100 50 0 100 200 300 400
— SCALE OF YARDS.—

SHELL-BURSTS SHOWN THUS:- *

POSITION X.

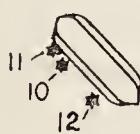


COURSE

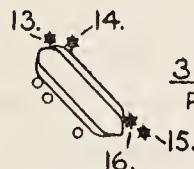
3.26
P.M.

3.39
P.M.

TIMINGS OF SHELL-BURSTS
IN POSITION X.



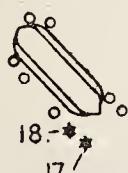
3.50
P.M.



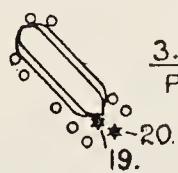
3.53
P.M.

3.37
P.M.

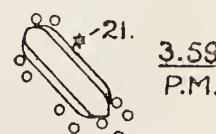
TO TARGET



3.55
P.M.



3.57
P.M.



3.59
P.M.

board 3-pounder gun and one grazing the bulge. One fell close alongside the forward bulge, and, exploding in the water, caused it to leak. Fortunately the shell that struck the 3-pounder did not hit its fuse, but broke the shell up without bursting it. The gun was thrown on to the quarter-deck and several men were wounded. The signal-halliard block was brought down from the mast-head, a portion of which struck Commander Carter,¹ the signal-halliards coiling themselves round the neck of my Chief of the Staff, Captain Bowring. Standing with a watch, it was possible to foretell the exact time a salvo would arrive, the three or four shell making an unearthly shriek. It was quite evident that the battery was shooting far too well for the monitors to stand a chance of surviving if we remained. I therefore made the "Re-form" and gave up the attack. Then commenced the weird experience of steaming away and not being able to return a shot, as the monitors had no after-guns. The shore firing suddenly stopped at about 22,000 yards. Now the extraordinary thing was, that subsequent experience showed us that this battery, the Tirpitz Battery, could range up to 32,000 yards, and yet it let us steam steadily away without firing another shot, when for nearly another hour they could have kept us under steady fire. We could only steam at about seven knots, and had 10,000 yards to go before we were outside their range. The only explanation yet advanced is that the *General Craufurd's* last shot knocked down the lighthouse, which in all probability was being used as the main observing-station. If this was so, we owe to that lucky shot the fact that certainly two out of the three monitors were not sunk. To use a common expression, they had us really "absolutely cold."²

¹ This injury led to his being invalided from the Navy and the services of a fine officer being lost to the country.

² Information subsequently obtained locally at Ostend showed that the Germans, soon after commencing, had a "premature" from one of their shells close to the battery; this caused them to use *reduced* charges only from their guns—which would account for their large angle of descent and their failing to continue firing to a long range on that day.

The drifters hauled their nets and followed us out. Their experiences are given in a subsequent chapter. The observation-tripod ships followed also. On this occasion the tripods could not be used; they had been laid out in the morning and, as the tide rose while we were waiting to fire, the lifting-strops had become submerged and the wires could not be hooked on—so they had to be left behind; while we were away one had been destroyed, probably by a bomb. In that way this method of observation of fire was given away to the enemy.

The *Redoutable* (Captain Vincent B. Molteno), *Excellent* (Commander Edward McC. W. Lawrie), and *Bustard* (Lieutenant McGuire), with the *Amazon*, *Saracen* and *Nubian* as escort, the *Gransha* with a tripod, and the *Menelaus* with her kite-balloon in tow of the trawler *Peary*, had been bombarding the Westende batteries. Here the tripod came in for a bad strafing from 6-inch guns and had to be abandoned. The *Redoutable* had two 6-inch hits.

The net results of the day were one or more hits on Ostend dockyard, while the Westende batteries were also annoyed; but the bombardment also disclosed to us the Tirpitz Battery. My views as to the uselessness of ships bombarding under modern heavy gun-fire, which previously had been theoretical, were most practically confirmed. The German *communiqué* for once was correct when it stated that our ships were driven off by the shore batteries; but why the Germans did not sink us when they had the chance was not revealed.

On September 18th an attempt was made to bombard Westende, but it had to be postponed on account of the hazy weather. The operation was, however, carried out on the 19th.

In this same month, September 1915, the Commander-in-Chief of the British Expeditionary Force—Sir John French—was about to launch an attack farther south, and asked our co-operation to try and hold the enemy on the coast by threats of invasion so as to minimise the number of troops that the Germans could send as reinforcements to the point of attack. Now there is no operation more difficult to carry out success-

fully than to feign a landing that in reality will not take place. The reason for this is simple, namely, that a real landing should be a swift, sure, secret stroke. The whole art in its preparation is to avoid the slightest sign of what is about to take place. The only thing that occurred to me as practicable was to bombard Zeebrugge and also the Middelkerke-Westende sector simultaneously, and keep up the bombardment for several days in succession, while at the same time spreading rumours that a landing was in course of preparation in the hope that they would leak through into the enemy's lines. As it was desired to give the impression that the firing was a precursor to a landing, the batteries and observation-posts were chosen for attack, and not such objectives as the lock-gates at Zeebrugge and the dockyard at Ostend. On a subsequent occasion a more ambitious programme was carried out.¹ On the evening of September 24th the force available was split up into two squadrons. The *Prince Eugène* and *General Craufurd*, with five destroyers, two paddle mine-sweepers, one division of net-drifters and the yacht *Sanda*, all under the command of Captain E. Wigram of the *Prince Eugène*, left to bombard the forts of Zeebrugge, and, on the morning of September 25th, I took the remainder of the 12-inch monitors and the *Marshal Ney* to West Deep and opened fire on the shore defences at Middelkerke and Westende, firing 102 rounds of 12-inch and seventeen rounds of 15-inch.

The Zeebrugge squadron commenced operations at 7 a.m. At 9 a.m. the batteries replied with heavy guns, and at 9.15 the yacht *Sanda* was struck, probably by an 8-inch shell, and sunk. All her executive officers were killed, including Lieutenant-Commander Gartside Tipping, the oldest naval officer serving at sea. This gallant officer returned to the Navy on the outbreak of war at an age when most men are beyond active service, being over seventy years of age, and undertook the duties of captain of a yacht in the Dover Command in spite of the arduous work and exposure which the performance

¹ See page 94.

of his duties entailed. The drifter *Fearless* was active in saving the survivors. At 10.20 the nets were boarded and while this was in progress the drifter *Hyacinth*, Skipper Lawrence Scarlett, was heavily shelled. The crew, however, stuck to their work and saved their nets, for which steadiness under fire the skipper received the D.S.C. and the mate, J. Prior, the D.S.M.

On September 26th the monitors *John Moore* and *Prince Eugène* again bombarded Westende.

On September 27th also, Westende and Middelkerke were bombarded. On October 2nd the monitors again fired at the defences. After this, no further firings could lead to any pretence at landing, and so they were discontinued. Economy of guns was a distinct necessity. There were few available to replace those in the monitors, if they became badly worn, so that the number of rounds fired was strictly limited, the total being spread out over several days.

The Tirpitz Battery replied on most occasions and aircraft at times attacked the ships. On one occasion three planes flew out of the sun, which was low down, being near to setting, and passed at a height of about 3,000 feet over the *Lord Clive*, but, in spite of the low altitude, missed us with all the bombs.

During November the feasibility of landing troops inside Ostend came under consideration.¹ As this would have involved steaming straight in towards the batteries, several trial firings took place to see if it were feasible to allow a constant rate of change of range in this form of attack, and to ascertain the best method of correcting the initial rounds while steaming in to the target. Little difficulty was experienced.

On December 2nd the *Prince Eugène* fired on Westende. The weather was too thick for the *John Moore*, who succeeded her, to shoot. This was to test the new aiming-light erected at La Panne, so as to be ready to assist the Army if required.

On December 27th the *Marshal Soult* bombarded the gun-positions at Westende.

¹ See Chapter VIII.

On January 26th firing was carried out with five monitors at 20-second intervals against a group of strong positions near Westende. Rear-Admiral de Marliave, commanding the French naval forces, flew his flag in the *Lord Clive*. Aeroplane spotting was used, and also spotting from the fixed observing-stations in the Nieuport lines.¹ These results were carefully analysed, and proved very instructive, as considerable discrepancies were found to exist between the two methods of observation. Owing to the comparatively near positions of the fixed stations to the fall of shot, and the experience of the observers, there was little doubt that the aeroplane spotting was at fault. To test this, three places were chosen, well known to the air-observers, and plans of each to three different scales were made to correspond to different heights of observation. The observers were then in turn examined by dotting a pencil on the chart and being told to record their estimation of the distance of the pencil-mark right and left of the line of reference, and short or over from the point of reference. The results amply confirmed the inaccuracy of their estimation. This led to a complete revision of our aeroplane spotting methods. Starting from the fact that our targets were few, there was no great difficulty in the observers learning their targets absolutely by heart on the following principle.

Suppose us to be firing at Trafalgar Square, and assume Nelson's monument to be the *point* of reference and a line from Northumberland Avenue through the monument to be the *line* of reference. Then the observer has to learn by heart the distance right or left, short or over, of all the salient features, such as the Admiralty Arch, St. Martin's Church, centre of the National Gallery, etc. By so doing no estimation is required, the distances are definitely learned, and shell pitching on or near these points can be signalled at once with absolute accuracy.

¹ This was the first occasion when a fleet of five ships fired systematically with all rounds, or nearly all rounds, being spotted, and fire corrected. The organisation was one resulting from many weary hours of trials and labour.

At the same time improved methods, whereby the observer in the aeroplane was relieved of all time-taking, were introduced by a method suggested by the officers of the *Riviera*, which again was a very great advance and laid the foundations of all our subsequent accurate shooting. This result was a marked vindication of the trouble that had been taken in recording the results of every shot fired, and of carefully analysing all shootings. This universal practice was of great value, as it called the attention of the director officers to the evil of guessing corrections instead of applying them by definite rule, and tended to check errors in laying. The general rule laid down was to allow the full correction as reported by the observer, if the "spot" was outside 300 yards in distance or fifty yards in direction, and halve the correction if inside these measurements. I never omitted to analyse all shootings personally, when possible. The labour involved in these analyses and investigations was considerable, but was the real cause of the extremely good results ultimately obtained.

After this, bombardments were suspended for the remainder of the winter. I felt it was useless to attempt anything from the sea until the arrival of the *Erebus* and *Terror*, the new 15-inch monitors. The guns in the new battery installed at Knocke were proved at the end of March: Tirpitz guarded Ostend. The 12-inch guns and shore-mountings for dealing with the latter were designed and ordered. We were outranged at sea by at least 50 per cent. by the German batteries, so that smoke-screens and the larger guns were the only reasonable chance of inflicting material damage.

On April 24th the mine-net barrage was stretched along the Belgian coast, and from this time onwards the 12-inch monitors took up a daily patrol along this line, firing at the German destroyers as occasion offered. In this they did far more useful work in stopping the laying of submarine mines in the Channel than by attempting impossibilities. In July and August, 1916, firing took place from the Addenkirk gun (see Chapter VI).

The next firing operations that took place were in response to a request from Sir Douglas Haig to do all that we could to keep the enemy's troops on the coast during the early days of his advance on the Somme. Profiting by previous experience, we were able to carry out a more ambitious programme than that of the previous year. One hundred trawlers were collected, and, with monitors and destroyers, were anchored between Dunkirk and La Panne in full sight of the enemy, and kept there for four days and nights—an act of utter madness if we had been fighting any other sailors but the Germans. Experience, however, was fast teaching me their utter ineptitude as sea-fighters. At the same time rumours of a landing were spread far and wide, so as to deceive the enemy. Troops and field-guns were openly embarked on board monitors at Dunkirk in full view of the enemy aeroplanes. The Admiralty stopped all sailings to Holland. Every day bombardments were carried out, the firing being concentrated on two areas between Middelkerke and Westende. So successful were these devices that the German Consul at Rotterdam reported to his Government that a landing on the coast was imminent.

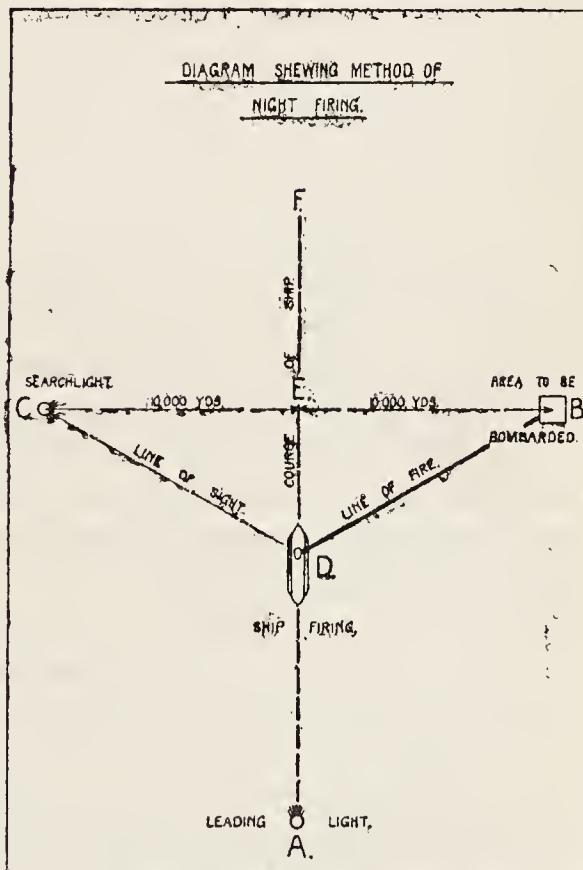
On September 8th the *Marshal Soult*, the *Lord Clive*, and the *General Wolfe* fired at the westernmost area. On the 9th the *Prince Rupert* and the *Prince Eugène* took on the firing. On the 11th the *Marshal Soult*, the *Prince Rupert*, and the *Lord Clive* fired. On the 12th the *Erebus* and *Terror*, the *Sir John Moore*, and the *General Craufurd* continued the bombardment. On the 13th the *Erebus*, the *Marshal Soult*, the *Sir John Moore*, the *Prince Rupert*, and the *General Wolfe* fired, and the *Terror*, flying my flag, went to Zeebrugge. But the weather turned bad, a stiff breeze sprang up, and both the aeroplanes from Dunkirk had engine troubles, and had to return, so that, as no spotting was possible, no firing could be done. On the 14th the weather was too bad to fire. On the 15th the *Lord Clive* fired in the morning and the *Terror* in the afternoon. Having now tried for seven days to keep up the deception, and the British attack having been launched this day

down south, the operations concluded. It was a satisfactory conclusion to receive the following letter from Sir Douglas Haig:

"I take this opportunity to express my most cordial thanks for the assistance you have so freely given to me in the joint operations which have been carried out with a view to deceiving the enemy. Although at the present time it is not possible to estimate the full effect of the action which you have taken—and the results may never be completely known—we know that some troops were moved up to Bruges and Ghent on September 14th and 15th. There can be no doubt that uncertainty and apprehension must have been caused in the minds of the German higher command at a time when rapid decision was important.

"I am, however, convinced that the success of the attack carried out by the armies under my command on September 15th derived considerable assistance from your co-operation."

About this time a system of night bombardment was developed for firing on areas such as villages where reserve troops might be billeted at night. We had to aim on a pitch-dark night at an invisible area from a moving ship. Suppose B to be the centre of an area that it is desired to bombard, at a range say of 10,000 yards, some convenient line for the ship to steam along, such as A D E F,



is chosen, and a ship with a searchlight is anchored at c which is on the line b e c at right angles to the course steered and 10,000 yards beyond it. That is, e c, e b, are both 10,000 yards and both at right angles to a e f. Somewhere at a a strong leading light is placed, possibly a ship at anchor; this is merely to act as a guide to the firing ship to keep approximately midway between c and b.

The operation then is simple. The ship turns on to the line a f and steers a steady course. The director-wires to the guns are reversed so that the indicator shows starboard training for port training. It is only necessary to keep the telescope on the light c for the guns to point on to the area b. The range is allowed from a table previously calculated according to the angle c d e. The great essential is to keep the ship's head "steady" on a course. With attention this is not difficult to limits of 1° . Of course, all angular errors in the ship's head produce a doubled error in the pointing of the guns. The maximum error for 1° in 10,000 yards would, therefore, be 250 yards; but if the guns are only fired by signal from the bridge when the course is exact, errors should be confined to a quarter of this amount, since $\frac{1}{4}^\circ$ is about the lowest practical reading on a gyro compass. If there is a cross-tide, the line a f must be the course "steered" and b c must be at right angles to this. The range must be calculated from the true position at the moment, i.e. the corresponding position on the course "made good."

The *Lord Clive* carried out this firing at Middelkerke, and quite upset the batteries, which were unable to find her owing to their not being able to get either the range or course of the ship. Commander Altham of the *General Craufurd* had the system turned over to him to develop, and he devised a clever indicator to facilitate more accurate laying. The system was then laid up in our mental store cupboard, like a dozen other devices for use when necessity arose.

On September 24th, 1916, the *Terror* bombarded Zeebrugge. After this the weather broke up early and the 12-inch monitors

had to be recalled from the patrol line, and the whole patrol abandoned, as it was impossible to keep the nets in order owing to the heavy seas which were running. Aeroplane spotting became more or less impossible, and firing operations had to be postponed till the following spring.

On January 30th, 1917, I received information that some destroyers were lying alongside the Zeebrugge Mole, frozen out of Bruges. I, therefore, arranged to attack the Mole with gunfire. Aeroplane spotting was impossible on account of cold and cloud. The tide was wrong, being a neaptide. It was recognised that if an alarm was raised the destroyers would clear out, so that it was useless to shoot for more than half an hour. There was a lot against the attack, but it was worth the trial. I therefore left at 9 p.m. on January 31st in the *Terror* for Dunkirk to pick up the *Erebus* and the motor-launches; but on the passage over heavy snow came on, making navigation very difficult. I got to Dunkirk, but, the snow continuing to fall thickly, I gave up the attempt.

We now entered on a period when we reaped the full benefit of our previous labours in developing scientific firing and spotting methods. Never was hard work more justified. The only pity was that the bombardments fell to the lot of the 15-inch monitors, to the exclusion of the 12-inch monitors which had borne the burden and heat of all the former work. However, this could not be helped. The extra range, heavier weight of shell, and greater accuracy of the 15-inch were preponderating considerations. Opportunities for bombarding were eagerly anticipated.

I determined first to attack the Zeebrugge locks as being the most difficult target. In fact, the visible target—had it been visible—would have been about the size of one inch of cigarette lying on the ground thirty yards away. Each gate was one-tenth the area of the deck of a monitor. On the result of this bombardment rested the decision as to whether it was worth the wear of guns to continue firing at these gates. Theoretically only one round in sixty-seven would hit a gate,

assuming absolute accuracy of aim. Practically, therefore, a much larger number of rounds would be required from a ship at sea. Again, unless both gates were hit, passage of submarines and destroyers could take place for at least two hours about high water, and beyond this there was a spare caisson which could be placed above the top lock, and the use of this trebled the amount of damage necessary to stop traffic through the locks. In other words, we had three locks to break up to do really useful work.

I was warned by the Admiralty that they had no more 15-inch guns to give me to replace those in the monitors, so, with the spring advance on the coast about to commence, with the prospective landing and the support that that landing would require from the monitors, I had to exercise economy in the number of rounds I could fire, and had to use such rounds to effect the best possible results, and not merely to interest the British public. The difficulties from weather considerations of bringing off a bombardment were very much increased by our having to use a smoke-screen, as this necessitated the wind being on shore, whereas conditions of observation and the state of the sea were more favourable, as a rule, with offshore winds. Surprise was necessary, as otherwise the enemy would also start a smoke-screen. Unless we could get in the ranging shots before the enemy's smoke-screen started, spotting would be impossible. Firing at daylight was, therefore, advisable, so that no warning of our approach would be given. At the same time, the northern route between the mine-fields was chosen as being less likely to be observed than an advance up the old patrol-line from the direction of Dunkirk.

I was determined to take the *Marshal Soult* to make a third 15-inch gun ship. Her speed was only five knots, so she had to be towed. This reduced the speed of the whole fleet to ten knots, which just allowed us to make the passage from dusk to dawn. To provide an aiming-light, I towed a 12-inch monitor as well.

In this manner did our Armada sail : the *Terror* (Flag), towing

the *Soult*; the *Erebus*, towing a 12-inch monitor, destroyers and motor-launches and paddle mine-sweepers being in company. The little drifters were no longer required, such was the contempt engendered by the lack of enterprise on the part of the enemy's submarines.

Five times we started and crossed the North Sea, and four times we had to turn back on account of cloud, which prevented spotting. On each occasion at 1.30 a.m. I had to decide whether to go on or turn back, since it was necessary to disperse at a distance from our firing position before the enemy's daylight reconnaissance could spot us. A harder duty never falls on an Admiral than to give up an operation. Every one is disappointed. Few appreciate the necessity for the decision, which is usually interpreted by the younger element as being indecision; but these things had to be done, in spite of some of the Press howling to know what the Admiral at Dover was doing, and why he was not bombarding Zeebrugge, thereby gratuitously calling the attention of the enemy to the very spot that it was my earnest desire to have lulled into a sense of security. I had to go to Sir Edward Carson, then the First Lord of the Admiralty, and ask him to approach the proprietors of the most insistent paper with a view to having these warnings to the enemy stopped in the highest interests of the country. For we were at war.

I commenced the detailed plans for the Zeebrugge bombardment on February 10th, 1917, and worked every day when I was at Dover. Generally I worked at it three hours daily and did not finish the general plan and rough orders till March 10th. The mass of new detail requiring co-ordination was considerable—method of sailing, position of firing, days when firing was possible, auxiliary methods of fixing the positions to anchor in before daylight, so that they would be reasonably accurate, the details of the smoke-screen (this was the first occasion for using the motor-launch screen), the various methods of anchoring the boats and ships according to the direction of the wind, the protection of the flank in easterly or

westerly winds, the orders for spotting for aeroplanes, the orders for firing and correcting for range, the transparent grids adjustable for variations in the actual anchoring position from the proposed one, the air attack co-operation, the aiming-light arrangements (this also was tried for the first time)—all these and many more matters had to be weighed and digested. It may appear a simple matter to arrange a firing, and so it is, but to get as near to the maximum accuracy as possible means days and weeks of thought and work. The following account of the difficulties in carrying out the attack owing to weather is taken from my diary of 1917:

“The 25th of March was the first day that an attack was possible; arrangements were therefore made for this day. Mist came down in the afternoon, and I had to cancel them.” From now onward, tides not suitable or weather bad. “On April 8th appeared hopeful, but weather changed and had to countermand.” Weather continued bad till next time the tide suited. “On 18th April at last made a start. On arrival at Dunkirk found that *Erebus* had swung foul of a destroyer and fouled her own propeller; cleared it at last, only just in time to make a start for Zeebrugge. Then, in turning on the shallow banks, *Soult*¹ sheered while *Terror* was turning and parted the tow. It was then too late. Gave up the attack and separated monitors so that the enemy should not see three lying together. It was a patience-wearing, cold, and cheerless night; but it is well when several troubles come together.”

“On Sunday, 22nd April, another start was made, but low cloud necessitated giving up the attempt at 3.15 a.m. On the 24th another attempt was made. Hopeless weather.” After this the Commodore at Harwich had other work on hand, so further attempts had to be postponed, as Admiralty did not wish us to attack without the support of some of the Harwich destroyers. “10th May, weather turned promising, then changed to haze.”

¹ See page 29.



"MARSHAL SOULT" BEING TOWED TO BOMBARD ZEEBRUGGE.
An inconvenient method of going into action, necessitated by her slow speed.



"LORD CLIVE" BEING SHELLED BY THE TIRPITZ BATTERY AT BOMBARDMENT
OF OSTEND, SEPTEMBER 1915.



THE RESULT OF BOMBARDING ZEEBRUGGE LOCKS, MAY 12TH, 1917, AT A RANGE
OF 28,000 YARDS.

The visible size of the lock gates was the same as that of half a cigarette at 30 yards' distance. Theoretically, only one shot in sixty-seven could hit such a target. Shots XX were very close. A and E, Lock-gates. D and C Swing-bridges. B, Spare Caisson.

On the 11th May the wind changed to N.E. I started at 6 p.m. in the *Terror*, with the *Erebus* and the *Soult* in tow and usual fleet of M.L.'s, etc., passed the North Goodwin nets at 10.15 p.m. and arrived at the firing position with all the vessels and commenced firing at 4.45 a.m. On this occasion, in order to check our position for firing, I had arranged for Commander Fraser to start in the *Lydiard* from the North Goodwin, steam straight to the firing position at high speed, and lay a buoy; then to go on till he sighted the junction of Zeebrugge breakwater with the shore and return to the buoy, checking its position by the reckoning from both Zeebrugge and the North Goodwin.

Now, unexpectedly, we discovered that our position was more accurately determined by his long run across the North Sea than by the short run into and out from the Mole. The variations introduced into the speed of the destroyer by the varying depths of the shoal water close to the shore destroyed the accuracy of such a run—a useful piece of experience. On her way out from sighting the breakwater, the *Lydiard* had a torpedo fired at her. The smoke-screen was quite a success. The Knocke Battery fired, direction fair, but it was evidently trying up and down for range. This accuracy of direction I put down to our black cordite smoke showing over the white phosphorus, and took measures to avoid this in future by steaming a destroyer smoke-screen the whole length of the white smoke.¹

Plate X shows the photographed result of the firing. Both lock-gates were very nearly hit at x x. The ringed circles are shell holes. The shooting was good, but not sufficiently promising to lead to hopes of destroying both gates without unduly wearing the guns and rendering them useless for the important work planned for that summer. A and E are the lock-gates, C and D swing-bridges, B the spare caisson. Firing was stopped, owing to the spotting machine exhausting its supply of petrol. The relief machine had an engine failure and landed in Holland. The aero-

¹ The effect of this is shown in Plate XVI.

plane spotting by Lieutenant Gow was most successfully carried out. The machine was in the air for four consecutive hours, and only just had sufficient petrol to land at Dunkirk. While we were busy on the water a fine fight—or rather series of fights—was in progress overhead. The air-patrols had been elaborately arranged, the great desiderata being the protection of our spotting-machine, secondly the driving off of enemy spotters who could successfully range the 12-inch Knocke Battery and the 15-inch Jacobsenessen on to the squadron, and, thirdly, it was well to drive off enemy bombers, for many of our vessels were deficient in A.A. guns. Throughout the whole four hours our fighters were busily engaged, in many instances fighting against superior odds. In one case seven of our machines were attacked by a formation of fifteen hostile craft. The account of these gallant fights is fully given in Chapter XIX.

I had intended going on and bombarding Ostend the same day, but the haze would have made it difficult to fix our approximate position off that port. I did not want to shell the town in the opening rounds. This attack was therefore deferred.

We tried to get off the attack on Ostend on Sunday, 13th May, 1917, but had to turn back at 2 a.m.

At this time I was bothered by people writing and practically calling me a traitor. This was the result of ill-informed newspaper comments. The following was one of my answers to a clergyman who wrote giving his own views and those of his friends :

“I have to thank you for your letter and the spirit which prompted you to write.

“I must apologise for having been so long in acknowledging it; but, believe me, I have been, and am full of work, and have but little time for my lighter and more amusing correspondence.

“In the wars of the eighteenth and early nineteenth cen-

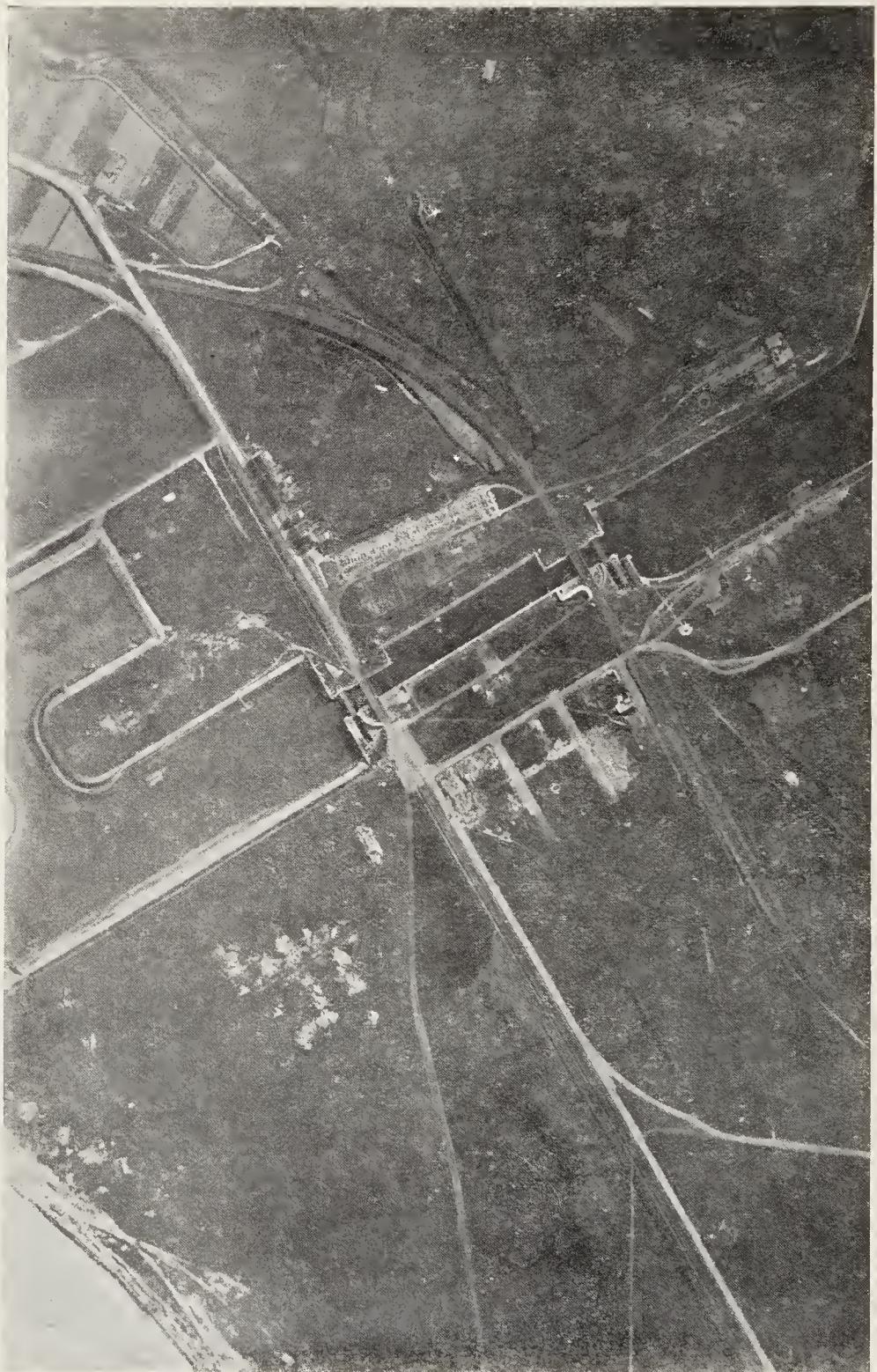


ZEEBRUGGE LOCK BEFORE THE BOMBARDMENT OF MAY 12TH, 1917.

Showing how the lock was used as a base for vessels.

PLATE XI.

[102]



A TYPICAL PHOTOGRAPH OF THE ZEEBRUGGE LOCK AFTER THE BOMBARDMENT OF
MAY 12TH, 1917.

Showing that it was deserted as a base for vessels.
PLATE XII.

turies I believe it was not uncommon for an ignorant British public to burn admirals and generals in effigy, and even sometimes at the moment they were gaining victories for the nation.

"Should your friends contemplate treating me to a mock *auto-da-fé*, I would counsel them to be careful in choosing their dates ; otherwise they may make themselves as ridiculous as their predecessors in history."

Then followed a period of impossible weather.

On Saturday, May 26th, we again sailed for Ostend, and got to No. 2 Buoy, but had to turn back. The wind was off-shore and the smoke-screen impossible.

On June 1st, being rather worn out, I went to Eastbourne, in the west end of my command, hoping for a week's rest. But after three days, on Monday, June 4th, the weather cleared, so I left with the *Erebus* and *Terror* at 11 p.m. We went via Dunkirk and the usual patrol route, all arrangements being much the same as for Zeebrugge. A successful operation was carried out (see Plate XIII). We damaged five out of eight of the principal shops in the dockyard, but the floating dock escaped, which was a pity.

The damage was done at A, B, E, F, G, H, I, K, O, P, R, S, and a ship was sunk at w. The method of ranging was to drop the first round about 2,000 yards short of the east estacade, and, when the result had been spotted, to lengthen the range by 1,500 yards, and, when satisfied as to direction being reasonably correct, to lift straight on to the target. By this means any chance of damaging the town with the opening rounds was avoided, and the observer could see distinctly the opening splashes in the water. At any time during the firing a round could be dropped for re-ranging, but this was of doubtful utility unless the shot could subsequently be spotted on to the actual target. The German batteries replied, but could not get us owing to our smoke-screen, although several rounds fell fairly close,

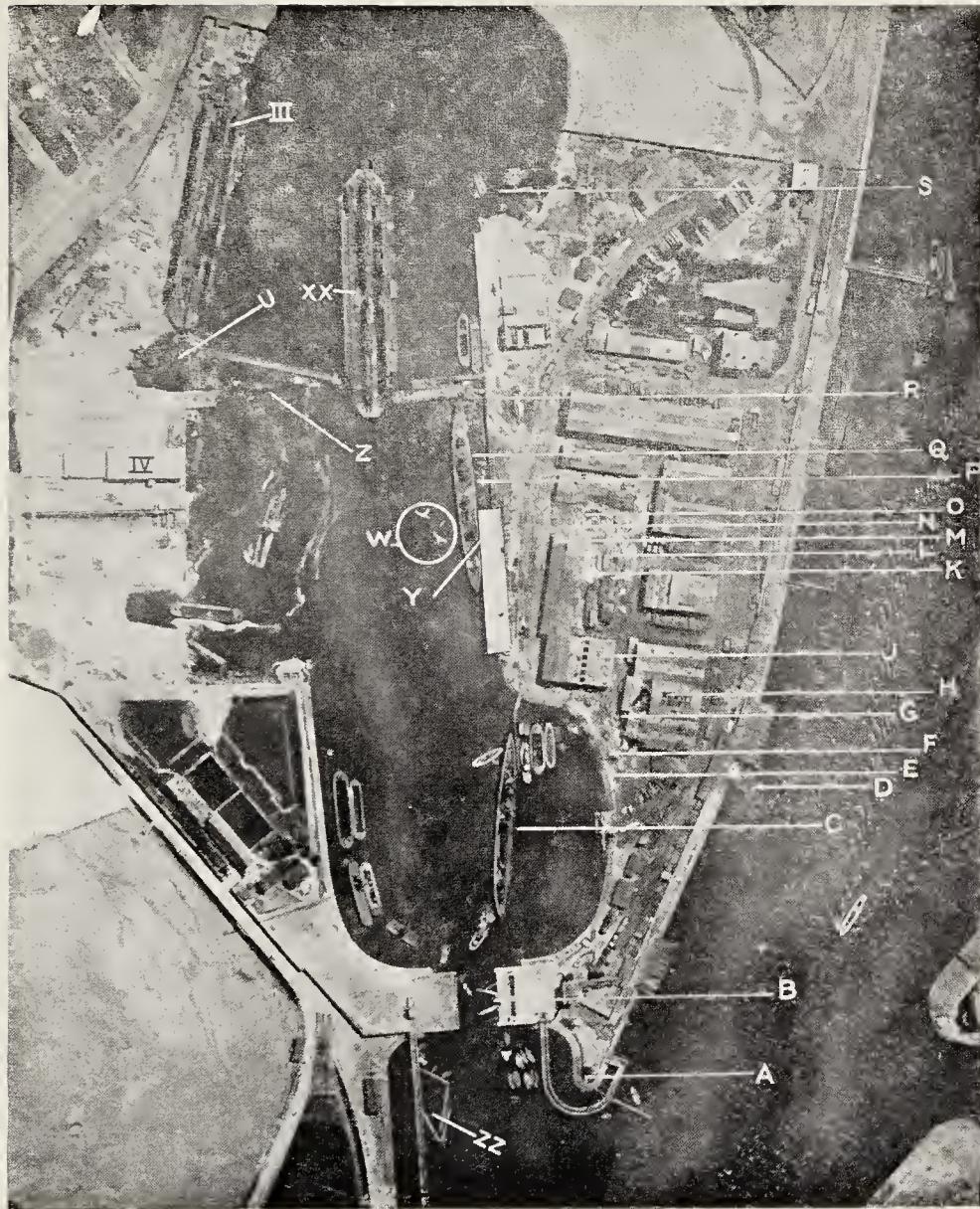
As we were arriving at our anchorage we observed gun-flashes to the northward, and concluded that Commodore T. from Harwich was at work on the German destroyers. I therefore sent our destroyers to try and cut the enemy off from Zeebrugge. The Germans, however, were able to get in before our boats could intercept them. That morning we picked up a useful piece of experience—about half an hour after commencing firing the monitors suddenly began to roll, which was rather upsetting for their aim. The sea that caused this movement was due to the fast steaming of the British and German destroyers an hour earlier some fifteen miles away. This sea raised by boats steaming remained in my mind, and was allowed for in subsequent operations. The airmen reported the smoke-screen of the enemy to be most efficient. It soon hid the target completely from view. They also observed the Tirpitz and Hindenburg Batteries to be firing rapid salvos at the fleet, and the new Jacobsenessen Battery to be firing intermittently with two of her 15-inch guns which had been placed in position a week or so previously.

Very little aerial activity was displayed by the enemy on this occasion; probably the handling they had received at the Zeebrugge bombardment made them less keen. Our spotting-machines and the escorting patrols had things very much to themselves.

An account of the air patrols is given in Chapter XIX.

I was anxious to destroy the floating dock, and watched the weather carefully. On June 19th we left at 10 p.m., and, in order to vary the route, went straight across the old mine-field and spread the destroyers on a broad front, and swept up from the Sandetti to the Ruytingen, sending two destroyers up between Cliffe Island and Ratel in case any enemy boats were about. The wind turned off shore, and at 2 a.m. we turned back.

Up to July 5th we could get no further opportunity of getting off a bombardment, so I determined to reinstitute the old barrage-line on the coast, so as to have a monitor ready



THE RESULT OF THE BOMBARDMENT OF OSTEND, JUNE 5TH, 1917.

The lettered places show where damage was done. The floating dock, XX, escaped being hit on this occasion. We were able by our methods, without seeing the shore, to fire at this small area without any damage to the houses, which were only 300 yards distant on either side. The important places of damage were : B, the lock-gates damaged, which allowed the basin to drain at low water ; G, H, shells which destroyed the foundry ; J, shell which badly damaged the machine-shop ; K, L, M, N, O, one shop completely destroyed and another damaged ; W, the remains of a vessel sunk.

PLATE XIII.



THE RESULT OF THE BOMBARDMENT OF OSTEND ON SEPTEMBER 22ND, 1917.
Showing further damage and the floating dock sunk at XX.

to take advantage any time of the day for firing. Also I wanted all the water in the offing in my hands for the Great Landing.

On August 21st, 1917, the *Erebus* fired a few rounds on Ostend dockyard. From this time onward the monitors had orders to fire on the dockyard at Ostend whenever the weather and wind permitted. Three times daily the monitor on patrol reported by special code to the Commodore at Dunkirk what the chance of successful firing was. If favourable the motor-launches were sent out to make a smoke-screen, and the aeroplanes, if it was clear enough overhead, were got ready to spot. Day after day passed, sometimes without a chance of firing, sometimes with a favourable report; but the period during which the conditions were favourable was too short to admit of firing taking place.

On Saturday, September 15th, at last a chance arose, but the wireless of our aeroplane failed. Her messages were not strong enough for the *Terror* to take in, but the spare machine being close to her, took in her "ready to spot," and thought the trouble lay with the *Terror*, although the latter several times signalled to the aeroplane, "Are you ready to spot?" This was very disappointing, but occasionally things will go wrong. Very little exercise of brain-power on the part of the observer in the spare machine would have saved the situation. On 22nd September the *Terror* fired on Ostend and got three hits on to the dockyard and damaged the floating dock, which was most satisfactory, while our airmen bagged three seaplanes that came out. See xx on Plate XIV.

After this the Germans gave up Ostend as a sea base. They may have had a submarine or two under the shelters, but never again was a vessel seen in the harbour. The floating dock had a destroyer and submarine on it, which were got off. The lock-gate was damaged and the basin drained to low-water-mark, when a sunken vessel became visible, the result of our previous bombardment.

On Tuesday, September 25th, Sir John Jellicoe, Admiral Sir Henry Oliver, and Admiral Philpotts arrived at Dover and

came with Admiral Mayo and his staff up the patrol line. It was a quaint experience for them. Half an hour after leaving Dunkirk in the *Broke* we lost sight of the shore. After an hour's steaming we sighted the *Terror* and destroyers in the open sea, and the motor-launches just starting their smoke-screen. Nothing else was in sight except a small monitor five miles away right out at sea, burning her searchlight for an aiming-mark. Really our visitors must have thought we were humbugging when the *Terror* opened fire and fired single rounds at fixed intervals. A few minutes afterwards, while steaming about in the *Broke* we had altered course three points, a splash came from a Tirpitz shell about 300 yards off; it fell very near the spot where we would have been if we had kept on our original course. I apologised to the American Chief of the Staff for not having kept on and brought the shell nearer. His reply was quaintly American in humour: "Don't mention it, Admiral; by the time we get to New York that shell will have been close alongside right enough!" The result of the *Terror*'s shooting was most successful, as all the rebuilding in the dockyard done by the Germans was again demolished. On October 19th the *Terror* was torpedoed, and had to be docked. On the following day the *Soult* fired at Ostend and destroyed a high explosive magazine.¹ One German craft was sunk, and two were damaged. The enemy aircraft now began to become a nuisance. Seventeen aeroplanes and three German destroyers attacked our destroyers, so I arranged for a signal between destroyers and monitors to indicate that they were being attacked by aircraft so as to enable the monitors to burst 15-inch shrapnel over them among the aeroplanes.

On the 28th the *Erebus* was attacked by an electrically controlled motor-boat and her bulge was badly damaged.

These accidents ended the bombardments for the time. It was very satisfactory to have started from bed-rock with

¹ Probably that of the anti-aircraft battery to the S.E., and close to the dock-yard.



MONITORS BOMBARDING OSTEND FROM BEHIND A SMOKE-SCREEN MADE BY THE MOTOR-LAUNCHES.

The monitors, which were 6,000-ton ships, can be seen, and their size is a measure of the extent of the screen. The puff of black cordite smoke, showing above the smoke-screen, betrayed their position.



A MOTOR-LAUNCH BURNING A SMOKE-SCREEN.



DESTROYER SMOKE SHOWING OVER A WHITE PHOSPHOROUS SCREEN.
This was done to hide from the enemy the puffs of cordite smoke from the monitors' guns.

no sort of methods for long-range accurate shooting available, and to have evolved a method of placing shells where we liked, with really phenomenal accuracy. Moreover, our bombardments had obliged the enemy to abandon the use of Ostend as a harbour, and had practically limited his use of Zeebrugge as a base and driven him up to Bruges, which place, the only harbour left to him, I took measures to bombard, by installing 18-inch guns in three of the monitors.

The ships worked splendidly, and I am sure every one on board was as proud as I am of the successes they achieved.

EARLY MORNING

Lemon dawn of creeping daylight tints the surface of the sea,
Loom dark blotches marking places where the many vessels be.
Listen as the heavy cables through the hawse-pipes clanking run,
Then a space of busy doings—then the flash of opening gun.

Watch for shells to ours retorting—watch for Tirpitz¹ to reply.
Has he marked us in position? Has he spotters flying high?
Here it comes, with screech and thunder, like a score of topsails torn
From their bolt-ropes when the blizzard strikes the canvas off the Horn.

So we deal out devastation till the smoke-screen raised ashore
Blots the vision and our airmen fail to range us any more
Cordite, steel and high explosive, tons of dire destructive power,
And our months of thoughtful labour stand expended in that hour

¹ The heavy four-gun battery to the west of Ostend with guns ranging 35,000 yards, about 18 miles.

CHAPTER V

THE WORK OF THE TRAWLERS AND PADDLE MINE-SWEEPERS

The formation of the Trawler Patrol—Memorandum on traffic protection—Proposal to put the English Channel under a single Admiral—Number of trawlers available—Places of rendezvous—Dangerous areas—Methods of sweeping and escort duties—Dover Harbour as a trawler anchorage—Hard work of trawlers' crews—Assistance to vessels mined or stranded—Casualties suffered by trawlers—Mine-laying by trawlers—Operations of paddle mine-sweepers—Work on the Belgian coast—Experiences at sea—Losses to paddle mine-sweepers.

IN 1900 Admiral Sir Henry Jackson and I were sent by the Admiralty to the works of the Ansaldo Company at Genoa to inspect and report on the Elia blockade mine. We should indeed have been astonished if then we had been told of the enormous numbers in which *mines de blocus*, as they were then called, would be used in a war fourteen years later. We were much struck by the possibilities such a mine offered, not so much against commerce, which may be called its strategical use, as in a tactical measure to assist an inferior fleet in retirement. The employment then forecasted for such mines was to block an enemy's harbour and prevent the egress of their fleets; hence the name "blockade mines." This name led to mines of this nature being viewed rather askance by our Navy, since we, the strongest sea Power, always fostered the idea that it was our business to tempt the enemy to come out and fight, and not to block him in.

Nevertheless, steady experimenting was carried out by the staff of H.M.S. *Vernon*, the Torpedo School ship at Portsmouth, and an ingenious mine was evolved, which, like the modern Elia mine, in no way depended on electrical apparatus,

which class of apparatus, so far as we were concerned, was ruled out. Lord Fisher, when First Sea Lord in 1905, foresaw many uses for mines of this description, and 4,000 were ordered. This number was then considered to be very large, and, as these mines were expensive, the big inroad into the annual Parliamentary Vote was looked on by many as waste of money. The Germans, in the meanwhile, adopted a mine which was operated by electricity, but—and this is the important point—it had no “contacts,” that is, no metal surfaces rubbing together were used to complete the electric circuit and fire the mine, as for instance is the case when a bell-push rings an electric bell. Such surfaces, when used in damp mines, corrode and give trouble. The Germans, therefore, used a complete and unbroken metallic circuit from the battery to the fuse, and back to the battery again, and adopted a clever method of creating the electric current on a ship striking the mine.

An ordinary wet electric battery is not active, and cannot make electricity until a certain liquid is poured into it. The Germans, therefore, put the battery just inside the mine; and immediately over it, but outside the mine-case was a lead tube with a glass cylinder inside it. This glass cylinder contained the liquid required to make the battery active. The operation of the mine was simple. These lead tubes, or “horns” as they are called, stuck out from the mine at convenient places. When a ship struck a mine, one horn was certain to be bent, and thus the glass cylinder inside it was broken, and the liquid fell into the battery, at once making electricity and firing the mine.

Both our own and the German mines had an apparatus which moored them automatically at a desired depth below the surface; but the Germans introduced a simple contrivance which kept the mine on the bottom of the sea, close to its heavy circular anchor, for normally about twenty minutes after it had been laid. This allowed the submarine laying the mines to get well clear of the spot before the mine rose to its predetermined distance below the surface of the water. This apparatus was

irregular in its action, in fact hours sometimes elapsed before the mine rose from the bottom, and occasionally it required a gale of wind to shake it up and free it. The mines were moored by specially hardened steel-wire rope to "sinkers," that is, to circular anchors.

To sweep up mines, a pair of mine-sweeping vessels dragged a wire between them through the water which caught against the mooring rope of the mine. Then one of three things happened. Either the rope broke a horn, and the mine exploded, or the sweep-wire cut through the mooring rope and the mine floated to the surface; or, thirdly, the mine and its sinker were dragged along by the sweep-wire. In the first case, that of the mine exploding, no harm was done except that the sweep-wire was cut and another had to be got out. In the second case, if the mine came up and floated, it had to be sunk by gun-fire, and was often exploded in so doing. Owing to the possibility of the mooring-rope being cut night-sweeping was dangerous, because floating mines could not be seen and destroyed in the darkness, and might well subsequently be bumped by our vessels when on the surface of the water.

The dragging of the mines, as in the third case, constituted a grave danger, since, unless great care was exercised, mines would be dragged from a known dangerous area to the extreme edge of the area swept, which was usually water that was considered safe for navigation. Thus a new and unexpected danger might be created.

Remember, all the above troubles, barely sketched even in outline, had to be dealt with, not theoretically, not in calm, still water close to land, but had to be mastered by fishermen practically in sluicing tides in quite considerable seas, often in weather thick and misty, when the land was not visible. In these circumstances areas had to be searched with considerable exactitude. It was just these practical difficulties, which were encountered daily, that so enhanced the work of these men in my eyes and those of practical seamen who knew the work

they did ; and it is these same difficulties that are so impossible to explain to those whose lives are not passed on the sea, and who look on blue water as a nasty, uncomfortable waste, knowing nothing of the feel of a wet rope or the cut to the flesh of a rubbed wire. They can necessarily appreciate nothing of the rough-and-ready calculations as to place, and the margin for error that must be allowed for, to keep, even approximately, a fair reckoning as to position in channel weather, or any other of the changes and chances of sea life that go towards constituting practical experience.

The methods of dealing with these troubles will now be recounted, but the above brief description will indicate the nature of the German mine, the most efficient of all war appliances used by the Germans at sea, whose baleful influence it was our business to frustrate.

It is doubtful whether we could have defeated the Germans, at any rate as quickly as we did defeat them, if it had not been for the assistance which the Royal Navy received from the fishing community, and the resources which the country possessed in ordinary excursion steamers. Now that peace has come, one can attempt to convey an account of the wonderful work which was done by the trawlers and paddle-sweepers which were attached to the Dover Patrol. These craft were never intended for war, and their skippers certainly had no premonition that the time would ever come when they would be shepherding merchant shipping for their safety, sweeping up mines laid by the enemy in the fairway, or escorting the King, statesmen, and generals across the Channel. But Fate plays many tricks with most of us, and though these men were called upon to undertake many duties which they had certainly never rehearsed, they can, in looking back on the course of the war, congratulate themselves on having rendered the nation and the Empire conspicuous service in an hour of great emergency.

Any account of the operations of the Dover Patrol during the period when I was in command would be incomplete

if some attempt were not made to describe the work of these vessels and to convey some idea of the high standard of seamanship and courage which their officers and men displayed. They feared neither the forces of nature nor the power of the enemy, but worked with fine devotion by day and by night, in summer fogs and winter gales, and thus assisted not only in preserving millions of tons of merchant shipping from destruction, but in maintaining the essential lines of communication of the Army in France. Between 1915-17 the Dover mine-sweepers swept a distance equal to twelve times round the earth.

The trawler patrol was most ably commanded by Captain Vansittart Howard, a hard-working, accurate, and conscientious officer, and he was assisted by Commander W. Rigg. This force had three distinct functions: traffic route protection, escort duties, and mine-sweeping. Originally the protection of the traffic routes was their main duty. When I took over the command at Dover, I found that the method of dealing with traffic that had been adopted was to pass it as far out to sea as possible, and only to approach the shore off Folkestone. At this point it was necessary to keep close to the shore to avoid the large quadrilateral Folkestone-South Goodwin-Calais-Grisnez, which was reserved for the drifters to work in. The fallacy of this method soon became apparent. Very little experience brought conviction that an area is more difficult to protect than a route. I therefore immediately took steps to alter the procedure, and, after a friendly tussle, the Admiralty approved my proposals, but for the Dover area only.

In discussing the matter with the Admiralty, I pointed out that, so long as we allowed merchant vessels to roam over the sea, so long would we have an area and not a line to protect; so long as we sent escorts with special vessels, instead of defending a line, so long should we dissipate our available strength. In my view, the idea that vessels should be kept away from headlands was entirely fallacious. "The argument," I remarked, "that submarines will turn up off headlands and destroy ships is not

THE DOVER PATROL

worth a moment's practical consideration; given a place where submarines collect, any one in charge of patrols can deal with that area and the submarines in it." In the Dover area we had a total of about 4,000 square miles; but our protected area was only about 400 square miles, therefore our method was based primarily on the "heresy" that ships should be confined to one route, and that all available strength should be employed to protect that route. I pointed out that this did not apply to the observation and stopping of enemy vessels at the eastern end of the Straits, which had a separate force and organisation for this purpose, but merely to the defence of the line of shipping up and down the Channel. This latter defence consisted of armed trawlers to seaward of the ship-route about three to five miles apart, with destroyers every twenty-five miles to support them. These formed a hedge to protect the traffic. "Of course," I added, "no defence is immune from attack by really bold and competent submarine captains; but a deterrent, such as this defence, has considerable effect on the more numerous class of ordinary captains."

Arguing on these lines, I submitted to the Admiralty: "As we stand at present, the Navy cannot divest itself of responsibility for the loss of merchant vessels. The country is not in a temper to stand it; and some radical and thorough change in organisation is required. The old theories have been tried and found wanting. By all means let us reconsider the fundamental principle of defence of our shipping, and be guided by practical experience and common sense." At the same time I proposed that all the channel traffic should be put under one Admiral. No doubt good reasons existed against this suggestion, as it was not approved. But in another war the idea might well be reconsidered and adopted. The results justified our new method, since, out of 100,000 merchant vessels passed from Beachy Head to the North Foreland during the three years 1915, 1916, 1917, only forty-eight were mined and seven torpedoed.

Now the function of protecting the traffic was discharged

by dividing the whole length of the traffic line from Beachy Head to the Downs into sections, and stationing two trawlers in each section (see Plate XVII). This was found to be better than spacing all trawlers at equal distances, since a pair of trawlers was less likely to be attacked by a submarine than a single vessel, the second trawler being a threat to the attacking submarine. These pairs of trawlers formed a screen to seaward of the traffic line—a thin screen it is true, but it was marvellous what a safeguard it was. The logs of captured submarines showed the great aversion the U-boats had to any form of patrol vessel, and, when one was sighted, how invariably the submarine dived out of sight.

When, during 1915, the mine-laying submarine became active, the whole of the traffic routes had to be swept daily by the trawlers, and I took steps at once to fit all trawlers possible for mine-sweeping. The organisation of the patrol for guarding the traffic line fitted in admirably with the sweeping for mines, since each pair of boats could sweep its own section of the route once in each direction, thus covering a double band of the route; after this, they hauled in their sweeps and went on with their traffic duties. The maximum number of trawlers ever available at one time for duty in the Dover Patrol was sixty-six. This maximum, however, was hardly ever reached, since, owing to collisions, and vessels being mined and not at once replaced, some three to four were usually absent for long repairs. In 1917 twelve trawlers were detailed to be fitted as mine-layers, and, as the process took anything from five to thirteen weeks, our complement of available trawlers was again, for this reason, considerably reduced.

Twenty-four to twenty-six trawlers were stationed one mile south of the traffic route in force, between the South Goodwin Light Vessel and the limits of our patrol at Beachy Head. When twenty-six were available, the two extra increased the patrol at Beachy Head. Each unit of six was under the command of an officer in a wireless trawler stationed at each of the rendezvous—South Goodwin Light Vessel, Folkestone

Gate, Dungeness, and *Royal Sovereign* Light Vessel. Signals passed by wireless to the officers' ships were communicated by Morse, semaphore, or flags to the vessels attached.

These vessels on patrol remained on their stations for four days and four nights. In addition to the above, two trawlers were stationed at Boulogne for sweeping the entrances at daylight each morning. Two trawlers were stationed at Dunkirk for sweeping from the Dyck Light Vessel and the secret man-of-war route.

For four days twenty-six trawlers were nominally resting, coaling, provisioning, and changing boiler water, which last had to be done once in six weeks. By the end of March 1916 all the trawlers with sufficiently strong winches had been converted into sweepers, and after this all the routes in force, and an alternative route from Folkestone to Boulogne, or from Dover to Calais, and the secret man-of-war route from Dunkirk to Dover were swept daily, and became a part of the daily routine of the trawlers on patrol. That part which could not be completed by them was done by the trawlers resting.

The routes in force which were swept daily were kept as close to the shore as convenient, and, if possible, within the ten-fathom line. Similar sweeping sections and similar routes close to the shore were adopted and used to the end of the war by the French Authorities.

The commanding officers in the wireless trawlers at the rendezvous were supplied with the latest sailing directions for all vessels passing through the Dover area, and it was their duty to see that no vessel passed into the Dover area without being supplied with the latest directions for the route in force.

When mines were discovered, either by sweeping or vessels striking them, a wireless message was at once sent to Dover, when it was the duty of the Captain of the Trawler Patrol, as traffic manager of Dover, in the first instance, to submit a dangerous area and the necessary changes in route, for my

approval (see Plate LX for chart of dangerous areas found and cleared by the Dover mine-sweepers), to enable all vessels to pass the area safely. The adoption of a route depended on many considerations, and was not always a simple matter. The usual radius of a dangerous area was one and a half miles round the position where the first mine was found, and, although in many instances this radius was increased to two miles, the one and a half was invariably found to be really sufficient. The larger area was declared when the position of the mine was too far from the shore to be accurately located.

When the dangerous area was declared, the route was put, if possible, on the shore side of the danger, so as to prevent the traffic straggling out into the Channel. The duty of the officer in charge of the units, when a mine was found, was at once to drop a buoy to mark the position of the mine swept up or seen. One trawler immediately steamed along the route in force to the eastward, and one along the route in force to the westward. If the route attacked was across Channel, the trawlers would steam both ways along the direction of the route.

As soon as the officer received the alteration of route from Dover he placed another trawler, if it was available, either to the north or south of the area, according to which side of it the traffic had been directed to go; this trawler acted as a mark-ship.

When in thick weather the dangerous area was some way from the land, a trawler as "mark" boat was always placed, using the "wreck-mark" signals as a point to guide the shipping in passing safely. If the height of the tide was suitable, the remaining trawlers on patrol began to clear the dangerous area until they were joined by paddle mine-sweepers or extra trawlers sent from Dover to assist them.

Owing to the strength of the streams in the Dover area, and the fact that the buoyancy of the German mines was not great, it was found safe to sweep over an enemy mine-field by trawlers, whose usual draft was fifteen feet, at all times

except from two hours before until two hours after low water.

To clear a dangerous area completely, that is a circle of one and a half miles radius, usually took from two to three days. When mines were first laid they appeared to have been placed in groups of six, later in groups of twelve ; and for some months we could estimate that the area was clear when either six or twelve mines had been found. The enemy, however, seemed to discover the fact that we resumed the normal route after so many mines had been found, and subsequently he laid his mines indiscriminately, sometimes five at one place, four at another, three, two, and even one mine along the routes in force. This considerably increased our work, as the sweep of the dangerous areas had to be prolonged, and it was not considered safe to resume the normal route until each dangerous area had been chain-swept—that is, two lengths of chain-cable thirty fathoms in length were towed between two trawlers which passed over every inch of the ground. When this had been carefully done no further mines in that area were ever found.

The trawlers on patrol generally began to sweep their sections at the first sign of daylight, and they continued until each section had been swept both ways. This sweep covered a band half a mile broad. It is remarkable that this, so to speak, scratch sweep, should have discovered such a large number of mine-fields and thereby prevented many of our merchant vessels being mined.

During the whole of the time that the trawlers were employed on patrol, even in the strongest gales and heaviest weather, they never took shelter or left their posts on patrol.

The ordinary method of escort performed by trawlers on patrol was to pass the convoy from trawler to trawler along the patrol line. As each convoy passed the rendezvous, the officer in charge reported by wireless to the Admiral the safe passage of the escorted vessel through the patrol—that is, at Beachy Head all convoys coming from the westward and entering the Dover area were reported on arrival, and all convoys

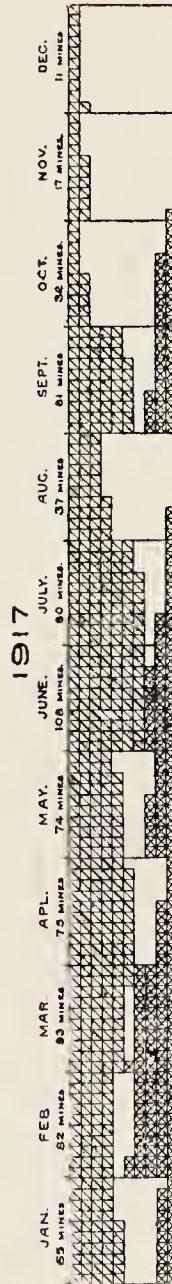
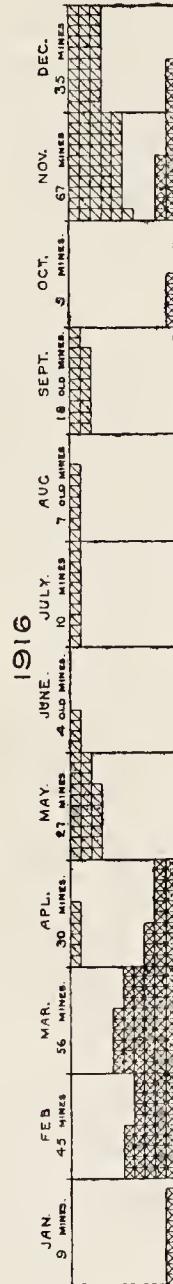
— GERMAN MINES DESTROYED IN DOVER AREA IN 1915 -16 -17 —

KEY TO CHART.

MINES BUNK ON ENGLISH COAST ▨

MINES SUNK ON FRENCH COAST □

EACH SMALL SQUARE REPRESENTS ONE MINE



leaving Beachy Head, going into the Portsmouth area, were reported when they left the Dover area.

The escort was a continual source of trouble, since if, when the trawlers arrived at Beachy Head, no Portsmouth escorts were available, the Dover trawlers had to proceed to Portsmouth, sometimes to Portland, and even as far as Devonport, before they could obtain relief. When they left on these long journeys they did not arrive back at Dover until after they were due for a further four days on patrol, and so missed their period of nominal rest.

The double escorts for Trinity House Vessels, and mine-laying ships and ships repairing telegraph cables, all of which had to be escorted in waters away from the traffic line, were done by the resting trawlers. These escorts sometimes lasted from one to three weeks, and we never knew when the craft would return until they actually arrived back in Dover.

The Admiralty also frequently ordered special escorts to accompany vessels with cargoes of exceptional importance. This frequently could not be done by the vessels on patrol without depleting the patrol line dangerously. This escort, therefore, had again to be taken by trawlers that were resting, or supposed to be resting. On such occasions, especially on the day before the change of the trawler reliefs, the patrol arrangements had to be re-shuffled, sometimes after midnight. In my opinion, this special escort by trawlers in the Dover area was quite unnecessary, however useful it may have been in other patrols. For us it meant additional work, without any increase in safety.

Before any trawlers came to Dover, the harbour was far more congested than any Harbour Master of experience would consider safe. But, being war-time, and an anchorage for them being absolutely essential, the trawlers had to be fitted in somewhere. As soon as they arrived, some eight or ten were given berths in an anchorage off the Prince of Wales Pier. Those not on patrol had to anchor close to the Detached Mole. When the trawlers occupied these two anchor-

ages they were disliked by the destroyers because the latter had no clear way to get out of the Western Entrance, and by the ambulance transports and hospital ships because they were too close to the fairway between the Eastern Entrance and the Commercial Harbour ; so they made few friends.

Soon after the resting trawlers had been allotted fairly safe anchorages in the harbour, it was found to be necessary to keep two berths clear for ambulance transports. This practically reduced the trawler anchorage by a half. The trawlers had to vacate the harbour and coal in the Downs, at Ramsgate, Margate, Folkestone or Grisnez, according to the directions of the wind and the state of the weather—which was distinctly rough on them, but it could not be helped. As soon as they had completed their coaling they had to return to Dover for provisions, water, and escort duties.

Dover Harbour is known as a most uncomfortable harbour in winter months. There is no rest for any one in a small vessel, and even the large destroyers, in the ordinary south-west and southerly gales, would roll twenty to twenty-five degrees each way, and the trawlers as much in proportion to their beam.

The trawlers, unlike the drifters, never got in the Granville Dock or Wellington Dock, as one was too shallow and the other filled up with vessels refitting ; some of the crew therefore had, on their resting days, to be on deck most of the time, day and night, for fear their vessel should collide with another trawler, or carry away its moorings, becoming a nuisance to all shipping in the harbour.

The crews of the trawlers at the Detached Mole could seldom come on shore in bad weather, and when the weather was moderate the duty steamboats which were supposed to be attending on them and making regular trips for their convenience, were perhaps broken down, or required to attend on the paddle mine-sweepers !

The programme of the trawlers when resting was as follows : One unit for twenty-four hours was called a duty unit, and was ready to go to sea at five minutes' notice, no leave being

allowed to anybody on board. The next resting unit was coaling, and had to complete with what coal it might require. The third resting unit had to provision and draw stores. The fourth resting unit was called the stand-off unit, and when it was standing off the whole of the crew that could be spared came on shore for instruction in gunnery and signals !

From this account it will be seen that the crews of the trawlers had practically no rest, but they undoubtedly ate well, slept well, and, having plenty of work, were always fit.

Our methods of patrol were justified by the practical immunity of the traffic-line from attack. I understand that in 1918 some trawlers had to be removed from the traffic line for other duties. As soon as the enemy discovered that they had left, he made a violent attack on the shipping, and no less than five merchant vessels were sunk in less than two days. When the patrols were replaced this sort of attack again ceased—an interesting piece of evidence corroborative of the value of the trawler in protecting a traffic line!

During the war I can remember only one case of disaster within reach of the trawlers in which they were not able to render assistance, either in rescuing life or assisting to salve the vessel. In this instance the signal that arrived at Dover gave the position of the vessel thirty miles wrong, so it was little to be wondered at that she could not be helped.

One of the most difficult mine-fields we had to deal with was a large one containing some thirty-two mines to the eastward of Folkestone Gate, and a similar one was soon afterwards discovered to the westward of Folkestone Gate. As the Folkestone Gate mine-field was too large and too wide for a passage through the centre of it to be cleared at once, the traffic was diverted to the southward of Folkestone Boom.¹

After Folkestone Gate, the entrances to Dover and the route from the South Goodwin Light Vessel to South Foreland had been heavily mined, I decided to hold up the traffic

¹ Folkestone Boom was the name given to the fragments of the barrage attempted in early 1915.

in the Downs and at Dungeness until the streams were running strong enough to make it fairly safe for deep-draft vessels to pass over the mine-fields. This difficult work of holding up the traffic, and releasing it at the ordered times, both by day and night, was entirely undertaken and successfully carried out by the Trawler Patrol. They became our police in regulating traffic. The enemy submarines were certainly scared by the fact that the trawlers had been fitted with depth charges,¹ and when they discovered that the trawlers on patrol between Beachy Head and the South Goodwins were so fitted, they did not venture to approach them to attack the ships which they were holding up and protecting in-shore.

When units of trawlers first arrived at Dover, they had no wireless telegraphy apparatus on board. Early in 1915 this began to be remedied, and before the end of that year one trawler, commanded by an officer, in each unit had been fitted with wireless telegraphy. From that time onward the task of fitting a second trawler in each unit was taken in hand, and by the end of 1916 two in each unit were equipped. So that one wireless telegraphy boat, commanded by a Lieutenant R.N.R., was in charge of each six trawlers; he had under his orders a Sub-Lieutenant R.N.R. in command of the second half or three trawlers.

As the skippers became more experienced, they were promoted to Group Skipper, and placed in command of a half-unit of trawlers. Later, as their experience increased, and men with special qualifications could be picked out, they were recommended for, and promoted to, Chief Skippers, and took command of a unit of trawlers. The best chief skippers successfully performed all the duties required of a divisional officer.

The complement of trawlers was small in the matter of deck hands (only six being allowed); it was never sufficient to keep a good stern look-out, and to have one man at the gun.

¹ A depth charge was a considerable weight of high explosive which could be dropped from a vessel and which exploded automatically on arriving at a prearranged depth.

When there were two guns, the complement was much too small. The only time that the complement of trawlers was sufficient, and then not until the ratings had been trained, was when forty Canadians and some twenty Newfoundland ratings were sent to this base for training, and remained there for anything from three to six months.

As with the six deck-hands there could only be three in each watch, their duties were as follows : one at the wheel, one on the look-out, and one stationed at the gun. As this gun was usually in the bows, but occasionally on the engine-room casing abaft the bridge, a good stern look-out was never kept.

Each trawler on patrol was armed with a 6-pounder high-angle gun, a 7·5 inch howitzer, and depth-charges, to protect the traffic passing through the Straits from attack by submarines. Experience showed the best armament to be a 7·5 howitzer, amidships, before the bridge, a 6-pounder high-angle gun fitted on the forecastle head, and two depth-charge trays, one on each quarter, and as many depth-charges as the trawler could conveniently stow. There is no doubt that the gun of a trawler, as a weapon of offence against the German submarines, was of very little use, but the 7·5 howitzer, up to a distance of 2,000 yards, was absolutely fatal if the projectile fell anywhere near its target.

When trained by service gunners at a shore battery, or at sea, the fisherman, as a gunner, became expert in a very short time. Fishermen have very good eyesight as a rule. I have known of a leading hand, who had never fired a 7·5 howitzer in his life, fire five practice rounds, and three fused bombs ; the first two fused bombs were very close to the target, and the third demolished it, the range being 1,800 yards.

The trawlers were also provided with hydrophones.¹ At night in calm weather, when the trawlers were at their rendezvous and stationed along the lines of traffic, the hydrophones were used every quarter of an hour. Unfortunately, the

¹ A hydrophone is a listening appliance to detect noises transmitted through the water.

hydrophone, although a useful instrument as far as detecting the presence of an enemy submarine was concerned, never enabled the hearer to judge what distance the submarine was from the trawler. In bad weather, or when the sea began to make a noise and roll the vessel, hydrophones of all descriptions were useless. Another great disadvantage of using hydrophones was that engines of all natures had to be stopped, or the sounds made by a submarine could not be detected even by an experienced operator. But the hydrophone is, nevertheless, an instrument capable of great improvement; I merely speak of it with our experience up to the end of 1917.

The Trawler Patrol was practically a training-school for ratings of all descriptions. Numbers of Canadians and Newfoundland volunteers were carefully trained, and returned to their homes as a nucleus of an Auxiliary Patrol in their Home Waters. Deck-hands who showed ability and a desire to improve their position were given instruction in seamanship, gunnery, and signals, and urged to pass for leading deck-hands. In the same manner, trimmers were urged to pass for engineers. Leading deck-hands were given instruction in chart work, continued instruction in signals and gunnery, and many of them passed for second hands. Second hands, who were young, and had been promoted from leading deck hands, often came to the front in a few months and passed for skippers.

The instruction in wireless telegraphy was carried out under the direction of the Flag-Lieutenant, Lieutenant Llewellyn Morgan, both on shore with the "Buzzer,"¹ and at sea in "Buzzer" trawlers. At first, some twenty wireless telegraphy ratings arrived from the Crystal Palace every two months. Towards the end of 1917 no less than forty ratings came every two months. The wireless work in the Dover Patrol was considerable, as each section of a danger area had to be reported when it was swept. The principle of reporting the entrances and the sections was a most satisfactory one, as, in addition to knowing when the entrances and routes were

¹ "Buzzer" is a short-distance wireless.

clear for the traffic, it created competition between the sweeping trawlers, and they endeavoured to clear their area and report their sweep before their neighbours.

So much for the work carried out by these vessels in circumstances which tested the courage, resource, and seamanship of officers and men. A large proportion were either fishermen, fresh from their peaceful duties, or merchant seamen who had been accustomed to the ordinary duties associated with pleasure trips run during the summer months round our coast. Never did men emerge from the ordeal of war with a finer record. If I had the pen of a practised writer like Marryat or Clarke Russell, I might hope to convey an adequate picture of some of the incidents which occurred during my period of command at Dover which exhibited the sterling qualities of these men, but such descriptions would occupy many chapters instead of the small space that I can allot. I can do no other, therefore, than record a few outstanding episodes, trusting to the imagination of my readers to fill in the pictures and form an adequate impression of the qualities which these men exhibited in face of varied perils.

One tale told of a Dover trawler is well worth repeating. It happened that one of the crew of a trawler got rheumatism, and the doctor, after seeing him, ordered him to hospital. Before going ashore, the doctor instructed the captain to signal to the depot to have an ambulance sent for the man at noon, so that he could meet his patient at the hospital on arrival. No man arrived at the hospital at the appointed time, and a rather irate medico visited the trawler to inquire the reason. The captain said, "Well, we tried to send him ashore, but a sergeant of police and a constable hailed us and said that on no account was he to be landed, or we'd be fined a hundred pounds; so we just kept him on board." "But did you not signal, as I told you, to the depot and tell them it was only a case of rheumatism?" said the mystified doctor. "Yes, we did; but neither me nor the signalman knew how to spell rheumatism, so we called it small-pox."

When the *Maloja* was mined off Dover, the trawlers on patrol and the duty units were sent at once to assist. They rescued a very large number of passengers, and letters were received from the survivors expressing their appreciation of the kindness and attention they had met with when taken on board the trawlers. Officers and men did all in their power to try to reclothe those who were wet, and to provide them with sal volatile and hot drinks. Lieutenant R. J. McClorry, R.N.R., in the *H. E. Stroud*, rendered particularly good service, and saved a large number of passengers.

The *Anglia* (hospital ship) was unfortunately mined off No. 8 Buoy; the trawlers on patrol again saved a large number of the passengers and crew. They also saved the crew of the *Lusitania* which was passing at the time, and which, on coming to the assistance of the *Anglia*, was also mined. This mine-field was responsible for the loss of three vessels.

The *Falmouth III*, when sweeping in the vicinity of the wreck of the *Anglia*, struck a mine and actually sank on top of the wreck. The *Falmouth III* was struck just before the bridge, and the explosion practically blew the ship in half, and she sank at once. Lieutenant H. Beedle, who was conducting the sweeping operations from the upper bridge, went down with the vessel, but came up and was rescued.

On this occasion two of the officers were learning their mine-sweeping duties under his instruction. One, Sub-Lieutenant W. A. McIntosh, was unfortunately drowned, and Lieutenant W. E. Eglington suffered so severely from the shock that he was incapacitated from duty for some three months. This officer, however, completely recovered, and requested to go to sea mine-sweeping again, and became an expert mine-sweeping officer, clearing many mine-fields in the Dover area.

The trawler *Elysian*, when coming from the French coast to Dover, during a very thick night, blowing hard from the south-west, miscalculated the tide, and found herself at daylight ashore on the N.E. part of the Goodwin Sands.

A heavy sea was running, and, as the tide rose, the waves were breaking clean over the vessel. The Deal lifeboat came to the rescue, and, as the tide had still many feet to rise, its crew advised the commanding officer that his vessel would be a complete wreck, and he therefore decided to abandon her, and the crew were brought safely to the shore. On the following night Lieutenant W. G. Morgan, D.S.C., R.N.R., in command of the trawler *Lord George*, stationed at the rendezvous at South Goodwin Light Vessel, sighted a vessel without lights. There were heavy squalls, and it was blowing a gale of wind. He challenged repeatedly without obtaining a reply, and then closed the vessel with the intention of firing. The weather cleared slightly and he recognised the vessel without lights as the *Elysian*, which on the rise of the night-tide had floated off the South Goodwin. He stood by until daylight, when, in a most seamanlike manner, in spite of the heavy sea, he got his line on board, and brought the vessel safely into Dover. She was practically undamaged.

The *Dagon*, Lieutenant E. E. Roberts, was the only trawler torpedoed in the Dover area during the war—a remarkable record of immunity. It was thought she had been mined, but, as no other mines were found in the vicinity, it was concluded that that was not the case. A destroyer was passing between the trawler and the place where the torpedo would have been discharged by the enemy submarine, and it is supposed that the torpedo was aimed at the destroyer, missed her, and struck the *Dagon*. The explosion was more violent than the usual German mine explosion. The trawler sank almost immediately, and none of the officers and crew, who were below, were saved.

When the enemy mines were first laid, the humanitarian principles of the skippers of the trawlers were greater than their discretion. On seeing a vessel mined, without thinking of the danger to their own vessel or its crew, for whom they were responsible, they immediately proceeded full speed into the mine-field, to the rescue of the distressed vessel. Though

strict orders were given to officers and skippers not to enter a mine-field, but to lay off and send their boats from a safe distance, the feelings innate in seamen and fishermen overcame their repugnance to disobeying orders, and this order was more honoured in the breach than in the observance when it was a question of saving life or risking their vessels and crews in the process. I am glad to say no trawler infringed the regulation after the *Étoile Polaire* was mined at South Goodwin Light Vessel. This vessel, when mined, sank almost immediately. Most of her crew were able to get away in her small boat. A strong tide was running to the N.E. towards the Goodwins, and there was considerable wind and sea from the S.W. Fortunately, it was near the turn of the stream, and, after the boat had got close to the breakers on the Goodwin Sands, the stream began to turn, and carried her again down the Channel. The officer observed the riding lights of the South Goodwin Light Vessel. The men pulled all they knew, and were much relieved, at length, to fetch the Light Vessel, where they were received with great kindness, and eventually brought by an armed trawler to Dover.

On October 26th, 1916, "a tip and run" attack was made by German destroyers on the patrol protecting the barrage from the South Goodwin Sands to the French coast. One of our trawlers, the *H. E. Stroud*, was struck by a shell fired from the destroyer when passing close to the vessel. It exploded on the brass boss of the wheel in the wheel-house, and killed the commanding officer, Lieutenant McClorry, R.N.R., and the men at the wheel and on the look-out. The second hand took charge of the vessel, and, though the steering gear was destroyed, brought her safely into Dover Harbour by means of relieving tackles.

Lieutenant Coles, commanding officer of the *City of Dundee*, performed a seamanlike rescue of some of the crew of the *Hull Trader*, which foundered about three-quarters of a mile S.E. of Dover. This officer was also the means of saving the lives of several of his crew, when his vessel was sunk in

collision off Folkestone Gate. He was on the upper bridge when the collision occurred. The vessel was very nearly cut in two, and began to sink at once. Before he could get clear of the bridge he became entangled in the signal-halyards, and went down many feet with the vessel. Fortunately he was able to clear his legs, and, when he came to the surface, a raft was floating near to him. He climbed on to this and assisted others of the crew to do likewise.

When the S.S. *Shenandoah* was mined near Folkestone Gate, on March 15th, 1916, Lieutenant Barnes, who was in command of the trawler *Macfarlane*, steamed towards her and ordered the master to endeavour to beach his vessel. The master complied, and the vessel was going well, when some of the bulkheads gave way, and she suddenly sank by the stern, leaving the portion from the bridge forward afloat. The *Macfarlane* picked up two boats after sending her own boats to the rescue. She then found a boat bottom up, with three men sitting on her and three more clinging to the wreckage close by. The men on the bottom of the boat reported they could hear some one knocking inside, and the *Macfarlane* ordered the trawler *Retorno* to go alongside this boat, put a tackle on and turn it over, and directed his own boat to stand by. On the manœuvre being carried out, the wireless telegraphy operator and the fireman, who had been some twenty minutes confined in the capsized boat, were rescued in an exhausted condition.

On April 14th, 1916, the *Electra II* was in a collision and was seriously damaged. Water rapidly rose in the machinery space. Chief-Engineer Stark, though standing up to his waist in water on the platform, successfully kept his vessel afloat and enabled her to be taken into harbour. On arrival at the place of safety, the decks were awash, the level of the water being within six inches of the fire-bars, and still gaining rapidly.

One of the finest pieces of salvage work was performed by Lieutenant A. Lansley, D.S.C., R.N.R., in the trawler

Etoile Polaire. This trawler was employed escorting a vessel engaged in repairing a telephone in the Sunk Light Vessel, when the S.S. *Volscian* was mined in the vicinity. The crew of the *Volscian* abandoned the vessel. They were picked up by the *Étoile Polaire*. Lieutenant Lansley observing that the *Volscian*, though down by the head, was not sinking very fast, decided, though the crew would not return to her, that he would endeavour to take her in tow and save her. Lines were put on board, and, though the vessel was in a dangerous area, Lieutenant Lansley decided to take the risk and tow her, as the current was running strongly at the time. He succeeded in towing her through the several dangerous areas until he arrived at the Rough Buoy at Harwich, when tugs from Harwich came to his assistance. He had brought the S.S. *Volscian* into shoal water, where she was practically salved before the arrival of the tugs. The sum of £75 for the officers and crew was awarded for this salvage. The value of the vessel certainly exceeded £10,000 !

The *St. Germain* was mined off Folkestone Gate; her bow struck a mine and the foremast was thrown over the side. Lieutenant A. Lansley was in command. The *Strathgairn* (Skipper Waters, D.S.C., R.N.R.), which was in the vicinity immediately came to the rescue. Lieutenant Lansley found the vessel was sinking and ordered Skipper Waters to make the line fast to the stern of the *St. Germain*, and at once began, after placing his confidential documents in safety, to transfer to the other vessel all the valuable ammunition, depth-charges, and small moveable gear. Lieutenant Lansley, on examination of the injury to the bow, found that a large stream of water was coming through the crack in the foremost bulkhead on the port side of the vessel. He, and the four hands who had volunteered to save her, provided mats and rugs and stopped up this crack. He then proceeded on board the *Strathgairn* and directed Skipper Waters how to steer and manage the vessel he was towing stern first. He then returned to the *St. Germain* and started the pumps. The

fires had been put out by the influx of the salt water, but sufficient steam remained in the boilers to keep the pumps working. Information had been received at Dover of the mining of the *St. Germain*, and tugs were immediately sent to her assistance. Soon after she was mined the weather became very thick and heavy, and unfortunately the tugs which proceeded to her rescue missed her and passed on to Dungeness Bay without sighting her. Lieutenant Lansley continued to keep the water from rising, and successfully beached his vessel at Folkestone.

When the *Othello II* was mined she was struck amidships, broke in half, and sank almost immediately. The wheel-house was so badly shaken that neither the doors nor the windows would open. But the second hand and the skipper and helmsman, who were in the house with a deck-boy, managed to push the latter out through the half-closed window. They and the rest of the crew were drowned. The deck-boy, who was a good swimmer, was the only one saved from this trawler. The boy was then appointed to the trawler *Weigelin*. Later, when she was mined, only one hand was saved, and he was the fortunate one; so this youngster had twice escaped with his life. He was later transferred to the motor-launches, but I fear these experiences must have rather unhinged him, as he was afterwards discharged from the Service.

After the *Othello II* incident, I gave orders to remove all the fixed doors of the wheel-houses, and to substitute a light frame canvas door, which could be easily removed, or pushed out by a kick of the foot. This, I am glad to say, was the means of saving many lives, as there were no further cases of men being drowned who were in the wheel-house.

Lieutenant R. S. Bainbridge, R.N.R., reported that when on his way to relieve the trawler *Highlander* at Beachy Head, on the evening of February 8th, 1917, he heard a heavy explosion about 7.45 p.m., and observed the destroyer *Gurkha* in a sinking condition, on his starboard bow, when he was in a position S.E. of Dungeness Light Buoy, four miles distant.

He made the wireless telegraphy signal—S.O.S.—giving the position of the T.B.D., and immediately proceeded to her assistance. It was blowing hard at the time. When he arrived alongside the T.B.D., only the forward end of the vessel was showing above water. He succeeded in picking up Commander Lewin and four of the crew, but, unfortunately, in getting his boat out with the derrick, the painter carried away, and the boat fell into the water and drifted away from him in the heavy sea. His trawler was rolling heavily at the time, so he decided to let the boat go and pick up the men who were in the water alongside his vessel. Only five were saved. Three, who nearly reached the vessel, were overcome by exposure and sank.

The surface of the water was covered with a thick black oil and the survivors' faces were so smeared with this thick oil that they were unrecognisable. Commander Lewin, who happened to be on board the *Ghurka*, was a strong swimmer and was not injured by the explosion. Though close to the trawler, he would not leave the water or accept assistance until the other four ratings were safely on board. For his courageous and gallant conduct on this occasion he was awarded the Stanhope Medal.

In one of the numerous raids made by aeroplanes and Zeppelins during 1915-17, when bombs were dropped in the harbour, the *Equinox* was not actually struck by a bomb, but one passed within an inch or two of the gunwale opposite the forecastle accommodation, and exploded on the surface of the water. The explosion was most violent, and wrecked the forecastle sleeping-place, where four ratings were in their bunks. Two ratings were killed outright, and one was dangerously wounded, but afterwards recovered. The side of the vessel and the funnel were riddled with small holes.

Dangerous areas were declared in 35 positions in 1915, 80 in 1916, and 175 in 1917, and only 45 in 1918. This fall in 1918 was entirely due to the barrage of mines

THE DOVER PATROL

laid by us in December 1917, which caused the enemy submarines to cease to pass through Dover Straits. The greatest number of dangerous areas being cleared at one time were seventeen between March 10th and 23rd, 1917, inclusive. A nice little lot to clear all at once!

The number of officers and crews saved by the mine-sweeping patrol from merchant vessels sunk in the Dover area was 904, and those who lost their lives totalled 151. From trawlers and paddle mine-sweepers which were mined or otherwise attacked by the enemy, 43 officers and 702 men were saved, and 295 officers and men lost their lives. The complement of the mine-sweeping patrol varied from 800 to 1,300 officers and ratings. Practically in the three years the number of officers and men implicated in accidents was equal to the size of the patrol at any one period.

The trawlers salved eighteen sea-planes and aeroplanes, and rescued their crews. After an air raid at Dover, the trawler *Highlander*, with Chief Skipper North, R.N.R., saved two of the crew of a German Gotha, which was brought down by gun-fire. The skipper endeavoured to tow the aeroplane into Folkestone Harbour. When he arrived off the Pier, he was not permitted to enter at once. On hauling the aeroplane close up to his vessel to avoid the towing-line getting foul of the screw, an explosion occurred; from information received later, it appeared possible that one of the crew of the Gotha, who had an injured leg, and whom they had attempted to rescue without success, remained in the Gotha and set in operation a delay-action fuse which eventually caused the aeroplane to explode. Fortunately the *Highlander* was not seriously damaged, and was easily repaired.

The total casualties to vessels in the mine-sweeping patrol, through mining, bombing, and collisions was thirty-eight vessels, eight of these being subsequently salved. The conduct of the officers and ratings of the trawler patrol during the whole of my time in command, was very good and compared

favourably with the conduct of officers and ratings of the Royal Navy.

I now come to the last of the duties of the trawlers, namely, that of laying mines. Mine-laying trawlers were first used in the Dover Patrol for the purpose of filling up the gaps in the mine-fields between the sandbanks on the Belgian coast left by the larger mine-laying vessels. This work formed part of the operations of laying the barrage round the submarine nests in Ostend and Zeebrugge.

Two mine-sweeping trawlers, *Osta* and *Ostrich II*, were taken from their mine-sweeping duties at Dover and fitted as mine-layers to supplement four mine-laying trawlers already fitted out. This was in April 1916. After the officers and crews of the vessels had carried out a three weeks' course in dummy mine-laying, the six trawlers sailed from Sheerness for Dover, and thence to Dunkirk, being based at the latter port. A mine-carrier was also stationed at Dunkirk. Mine-laying operations were carried out with these from the Dutch territorial waters to Zuidcoote Pass near Dunkirk continuously for six weeks. Being of medium draft, and handy, the trawlers were able to creep in through the sandbanks and lay mines closer to the coast of the enemy than the larger mine-laying vessels could have done. The success of the operations was entirely due to the fact that the work was carried out in dark or misty weather, so that the enemy had not the least idea where the British mine-fields were laid. At times when the work was actually in progress the weather suddenly cleared, and the trawlers were spotted by the enemy. The enemy immediately sent out bombing-planes and the trawlers were subjected to many bombardments. Twice the mine-laying trawler *Ostrich II* had narrow escapes. At one time no less than ten bombs were dropped round her mine-rails, the water splashing on to her deck. If a bomb had struck a mine the vessel would have been blown into fragments. After these operations had been successfully completed by the trawlers, they returned from Dunkirk to Dover.

Three of the trawlers were then sent to Portsmouth ; the other three, the *Osta*, *Ostrich II*, and *Carmania II*, remained at Dover. The last three vessels were employed afterwards laying a mine-field parallel to the net barrage which existed between the South Goodwin Light Vessel on the English coast and the Dyck Light Vessel on the French coast. This was the last time that the trawlers laid the old British mines. The operations on this mine-field were considerably delayed, and took a very long time to complete, owing to the unfavourable weather conditions. From the end of 1916 to the autumn of 1917 no mines were laid in the Dover area by the trawlers ; the few that were available—for this was before the delivery of the new mines began—were laid close to the enemy's coast by destroyers.

In the autumn of 1917, in addition to the *Osta*, *Ostrich II*, and *Carmania II*, nine trawlers from the patrol were selected and fitted out for the purpose of laying the new British mine. At this time mines became available for the long-projected big mine-field barrage, Folkestone to Grisnez, which proved so effective in stopping the submarine activity in the Dover area, and to the westward of this area.¹ The first lines of mines across the Channel were laid by four of the large mine-laying vessels. The trawlers laid the additional lines, filled in gaps, and extended the existing lines.

In the whole two and a half years that the trawlers were engaged on dangerous mining work no accident occurred ; the names of the twelve trawlers employed were the *Osta*, *Ostrich II*, *Carmania II*, *Pitfour*, *Russell II*, *Hero*, *St. Maurice*, *Erna*, *The Norman*, *Katelewis*, *Strathcoe*, *Savitri*.

During the daily sweep by trawlers in the Dover Patrol throughout the whole of the war the men employed, although perfectly aware that, when they began to sweep over dangerous areas, their vessels were very close to the mines, displayed courage, fortitude, and extreme devotion to duty. The margin of safety allowed for trawlers to begin

See Chapter XIV.

sweeping, which they did in all weathers, was only two to three feet when sweeping in bad weather. These vessels send¹ in a sea-way which reduced their margin of safety in bad weather.

It still remains for me to mention briefly the work done by the paddle mine-sweepers. These were faster and better suited to work with our patrol ships off the Belgian coast; but they did not, like the trawlers, possess the ability to work in all weathers. They cleared mine-fields quickly in fine weather, but had to remain in harbour when the weather began to get bad. Consequently to an Admiral at Dover they had not the same reliability as the stolid, solid, sturdy little trawlers.

The first paddle mine-sweepers arrived at Dover in July 1915. The number was gradually increased to fifteen. They were under the able command and guidance of Commander Rigg, to whom they owe much.

The ordinary duty of the paddle mine-sweepers was to sweep the alternate routes, and clear dangerous areas, when they were found, sweep the area where our submarines exercised for two days out of every four days, and to sweep any area where it was intended to place obstructions or mine-nets, or to lay a British mine-field. Their special duties were to sweep ahead of the monitors, destroyers, and drifters when attacks were made on the Belgian coast. At daylight, or when monitors were ordered to bombard the Belgian coast, they made an exploratory sweep ahead, and on many occasions, while performing the duties of sweeping ahead of the Belgian Coast Patrol, they were under heavy fire.

When important personages had to be taken to, and brought back from France, the paddle mine-sweepers, as many as three pairs, swept the intended route to be followed across the Channel at daylight, and again, if possible, just before the crossing of the important personages. When His Majesty was crossing to France, special sweeps by paddle mine-sweepers

¹ To send is to lurch ahead and down into the hollow of a sea.

were always made, and an alternative route was swept to ensure a safe passage, should the paddle mine-sweepers sweeping the ordinary route find enemy mines. This was necessary, as it was advisable to sweep the route only just before His Majesty started, and there would have been no time to clear a field had mines been found.

When His Majesty and important personages were crossing the Channel extra precautions were taken at Calais. The six trawlers under the command of the hydrophone officer were stationed off Calais for the night, using their hydrophones continuously, to detect the presence of any enemy submarine in the vicinity. At daylight they assisted the ordinary Calais sweepers to make a thorough search of the entrances off Calais, and then swept the usual passage to Dover.

The paddle mine-sweepers were the safest vessels for sweeping owing to their small draft, and to their great speed—some ten to eleven knots—which enabled the moorings of the German mine to be immediately cut. These then floated to the surface and did not remain entangled in the sweep, and were therefore less dangerous to the sweeping vessel. The only defect of the paddle mine-sweepers was their inability to keep the sea, or to sweep efficiently in bad weather.

The principal factor in safe mine-sweeping is the shallow draft of the vessels employed. Trawlers drawing 15 feet suffered many losses while on patrol, when mines were laid, and when searching and sweeping dangerous areas. Paddle mine-sweepers drawing 8 feet to 9 feet 6 inches as a maximum, were at least 75 per cent. safer than trawlers. Tunnel mine-sweepers, which were most successful in sweeping, and suffered no losses, had only a draft of 4 feet 6 inches. Many of their losses would not have occurred if the experience, which is not born in any one, but bought at the expense of the material and personnel, had been gained at the beginning of the war instead of at its close. Experience; nothing can supplant experience!

The paddle mine-sweepers were commanded by Lieutenants

R.N.R. and R.N.V.R., who had obtained mates' certificates. The remainder of the officers were Lieutenants and Sub-Lieutenants, R.N.V.R. The crews were composed of volunteers taken from all professions, and a large proportion of the deck-hands had never been to sea before.

The mine-sweeping officers, no less than four of whom were under my orders, were excellent in training sweepers and in gallantly leading their ships under heavy gun-fire, when ordered to sweep up dangerous mine-fields, both enemy and our own. These were Commander Walter Rigg, D.S.O., Commander Hugh Archer, R.N., Commander B. C. Parsons, D.S.O., R.N., and Lieutenant Arthur E. Buckland, D.S.O.

The standard of work done by the paddlers was high, and, though they were continually stopped by bad weather, they never failed in an attempt to leave harbour at daylight, and make a good effort to carry out the work which they had been ordered to do.

It remains to record a few of the accidents incurred by, as well as the services, other than mine-sweeping, that were rendered by these vessels.

In the early days, when the crews of the paddlers were new to mines, the ship's company of one vessel congregated on deck to watch a mine being sunk by rifle-fire. They expected a bit of a bang, but the explosion was so terrific that half of them fell down the hatchway, much to the amusement of those who had managed to keep their feet. The first night-sweeping carried out by the paddlers was sweeping ahead of the monitors and tripod-ships at the bombardment of Zeebrugge in August 1915. Everything went off successfully, and the tripod-ships were swept into position. The P.M.S. then steamed to the eastward of the bombarding fleet and waited until the monitors had ceased firing, and then swept the monitors back to Dover. After this the paddlers swept ahead of the monitors for all operations on the Belgian coast.

On October 6th, 1915, the P.M.S. *Brighton Queen* struck a mine near Nieuport while sweeping at night-time. She

sank very quickly but fortunately lost only seven men. This accident brought home to me the dangers of night-sweeping, which was afterwards undertaken as little as possible.

On January 1st, 1917, the S.S. *Sussex*, a large cargo vessel, struck a mine near the West Dyck Bank. The P.M.S. immediately proceeded to the assistance of the vessel, and found that she had come in contact with mine-nets which had been laid by our drifters in the vicinity to destroy enemy submarines.

The *Montrose* and *Nepaulin* crossed over the mine-nets safely, but the *Goodwood*, while attempting to do so, struck a net-mine. The *Redcar* went to the assistance of the *Goodwood* and managed to tow her into Dunkirk in a sinking condition, placing her in the hands of the salvage tugs at Dunkirk, where she was immediately dry-docked. The *Redcar* then proceeded back to assist the *Montrose* and *Nepaulin* with the S.S. *Sussex*. The vessel was safely towed clear of the mine-fields by the P.M.S., and was eventually salved. On January 6th two explosions occurred in the sweep, due, it was assumed, to German mines laid on the patrol. On January 11th nine enemy mines were swept up in the vicinity of the Dyck Light Vessel, and on January 12th three enemy mines were destroyed near the western approaches to Dunkirk.

On January 15th the *Redcar* was sweeping with the *Chelmsford*, and, after completing the sweep, was returning to Dunkirk when a large cargo vessel, the S.S. *Port Nicholson*, was seen to strike a mine about five miles west of the Gravelines Buoy. They immediately proceeded to her assistance and passed tow-lines to her. The *Chelmsford* passed his towing-wires, and, she and the *Redcar* towing, made an effort to beach the vessel on the Gravelines Bank, but the vessel sank within half a mile of the two-fathom patch, for which they were making. She was still being towed through the water when she turned turtle. While proceeding to the *Port Nicholson* to pass the tow-wire, four German mines were observed awash, and they were sunk by a French T.B.D.

To show the dangers attending sweeping, the *Eglington*, on

February 15th, was heaving in the sweep-wire when a mine was observed to be foul of it; the winch could not be stopped in the *Eglington* in time to prevent the mine hitting the stern, which it did; but fortunately a horn was not hit, so it did not explode, and dropped back into the water. The same thing occurred in the *Redcar* at a later period—a sort of incident to make one's hair stand on end.

On March 18th the *Montrose*, while sweeping off the Gravelines Buoy, struck an enemy mine and sank in fifty seconds, twelve lives being lost. On Friday, April 20th, the *Nepaulin* struck a mine near the Dyck and sank very quickly, eighteen lives being lost. As such pleasure steamers seemed absolutely to fall to pieces when struck by a mine, they had to be abandoned immediately this happened.

On June 24th, while the *Redcar* was sweeping in the vicinity of the Gravelines Buoy, with the *Kempton* and *Gatwick*, three ships abreast, three German mines were swept up, and, as the sweeping-wire had parted, the *Redcar* proceeded to sink the mines. She had sunk two and was approaching the third, at which some drifters were firing, when she struck a mine just at the forepart of the bridge. The whole of the fore-part of the ship, from the bridge for'ard, was cut right away by the explosion, and the 12-pounder gun crew, consisting of four hands, who were in that part of the ship, were killed immediately. Lieutenant Daniells, R.N.R., her captain, gave orders for the crew to stand by the boats, and went with the chief engineer to the for'ard boiler-room to examine the bulkhead. He found that the bottom of the bulkhead had been carried away, and that water was coming in, so that it was evident that the ship would not keep afloat. The *Kempton* and *Gatwick*, which were some distance away from the *Redcar*, had observed the explosion and immediately slipped their sweep and proceeded to her assistance. The *Redcar* by this time was very much down by the head, and the order was given to abandon ship, the captain remaining on board with the chief engineer to make fast the tow-line, in case one of the

other vessels attempted to tow. The crew got safely away in the lifeboats, and had just got aboard the *Kempton* when she also was blown up! One of the *Redcar*'s boats had not been made fast to the *Kempton* when the men had left it, and had drifted some twenty-five yards away from the *Kempton*. Two of the *Redcar*'s men, the Signalman and first-class P.O. seeing that there was not enough room in the remaining boats for all the hands of the *Kempton*, jumped into the water and swam to the boat, bringing it alongside the *Kempton*, where it was speedily filled with men. Many lives were saved through this action. The officer in charge of the drifters which were firing at the mines had proceeded alongside the *Kempton* with his drifter, and had gone on board to see if he could be of assistance and was on board when she blew up. He was also on board the *Redcar* when she sank. He had many exciting experiences during this day with his drifters, and saved many lives. The survivors from the *Redcar* and *Kempton* were safely picked up by the *Gatwick* and the drifters, and returned to Dunkirk, where they were accommodated on the monitors.

The mine-sweepers at Dunkirk had a very trying time with air raids,¹ but were fortunate inasmuch that, although the raids were very frequent, only one of the P.M.S. was hit, this being the *Albyn*. She was lying alongside the quay wall at Dunkirk when an aeroplane dropped a bomb on her, killing the commanding officer and the third engineer, and wounding two or three of the rest of the crew. Though severely damaged, the ship did not sink, and the fire caused by the explosion was soon put out by the other mine-sweepers lying beside her. An idea may be gained of the extent of the enemy bombing at Dunkirk, from the fact that on one occasion, when the mine-sweepers were over in Dunkirk for sixty days, fifty air raids occurred, bombs being dropped in profusion.

The paddle mine-sweepers were only attacked by submarines once, two torpedoes being fired at them in the

night-time, while sweeping ahead of the bombarding flotilla. They safely passed underneath the mine-sweepers, which were thus saved by their shallow draft. It was too dark for them to attack the submarine, and all that could be seen was the wake of the torpedoes when close to the mine-sweepers.

Such is a very incomplete account of the work of the paddle mine-sweepers in the Dover Patrol—daily carried out in the face of many dangers and, as what I have written shows, performed regardless of the perils attending it.

During the whole of my time at Dover, the officers and fishermen of the trawler patrol, and of the paddle mine-sweepers showed great fortitude and a fine spirit by implicit obedience to orders, zeal, and devotion to duty. No call was made to them without obtaining their most willing and ready response, and it is with pride that I recall the memory of having had such a splendid body of officers and men under my command.

THE TRAWLERS

Do you mind in 1914 when we started for the war
And cleared our holds of fish and ice and chuck'd our trawls ashore ?
We knew we wasn't trained to fight,
But being seamen, blow me tight !
Could navigate by day or night,
Of that you may be sure.

Of course we'd seen the men-of-war, but we hadn't got a gun,
And it seemed to us most likely that supposing that the Hun
Came up against our blooming boat
There wouldn't much be left afloat
To tell the wife at home about
When once the show'd begun.

It seemed a bit one-sided ; yes, you ask me why we went ?
Well, I'm blowed if I can tell you, we was volunteers, not sent ;
But when they asked if we would go,
We couldn't very well say " No,"
For we was sailors, as you know—
That's all the argument.

But there's something tells a Britisher who knocks about at sea
That afloat he'll beat a furriner, whoever he may be.
Their ships may be of bigger size,
And better too, but d—n my eyes,
Whatever out at sea he tries,
We're better men than he.

So we slipped out ropes and steered due south, for Dover Strait mind you,
To learn to fight and sweep up mines, and do as we should do.
We didn't argue or discuss
What Germany might do to us,
For, whether safe or dangerous,
We'd see Old England through.

CHAPTER VI

THE BELGIAN COAST; ITS PATROL AND BARRAGES

Memorandum advocating the institution of a barrage on the Belgian coast—General discussion of pros and cons—The laying of the 1916 barrage—The sinkings of submarines—A destroyer action—Loss of the *Clover Bank*—Withdrawal of Patrol ordered by the Admiralty—An exciting cruise down the barrage—Capture of the *Au Fait*—Enemy attack on the barrage—Cessation of Channel mining—Attack on the Patrol—Abandonment of the patrol owing to winter weather—Memorandum advocating the re-institution of the barrage in 1917 and its laying—Appearance of electric motor-boats—Attack on the monitor *Erebus*—Surveying the tides—Mine-laying to the N.E. of the barrage—A day on the patrol line.

THE Tirpitz battery near Ostend effectively protected that port from sea attack by the 12-inch monitors. During the winter of 1915-16 the enemy completed a large 12-inch 4-gun battery to the eastward of Zeebrugge,¹ again making all attack of the lock-gates impossible. Submarine mine-layers had begun to infest the Channel. In view of these developments the urgent problem was what to do to curb the enemy's activity. Drift-nets had become largely useless, as the enemy knew all about them and how to avoid them. No method existed of detecting submarines at night. It appeared to me that the only thing to do was to hem in the submarines by making the waters off the Belgian coast as dangerous to such craft as possible.

This, however, was no easy matter. Our mines were not of much value against submarines; a rise and fall of the tide of many feet occurred in the waters off the coast, and moreover

¹ The Kaiser Wilhelm battery of four 12-inch guns, called by us the Knocke battery from the neighbouring village.

the stream ran strongest at high water, thereby pressing the mines to a greater depth than that for which they were normally laid. Mines alone would not, therefore, stop submarines navigating at high water. How about moored explosive nets? Well, moored nets required constant attention, their electric batteries had to be charged periodically, and, further, if not protected, they could be destroyed by the enemy. The only thing that seemed possible was to keep a patrol watching the nets. But was this possible? To patrol about twelve miles off Ostend and Zeebrugge was a tall order. Behind us was the fate of the *Hogue*, *Cressy*, and *Aboukir*, all three sunk in one morning by a single submarine many miles from its base, while the suggested patrol meant attack from many submarines close to two of the enemy's best bases. Again, there was the danger of mines. If the English Channel could be so successfully mined, as it constantly was, the patrol line would surely come in for a greater share of those abominations.

Each of these points required special consideration. So far as direct attack from submarines was concerned, there were two points in our favour. The nets, if they could be maintained, might protect the patrol on one flank; and the monitor bulges should for a single attack prevent such vessels from being sunk. Destroyers, if attached to the monitors, would form a force to jump on the back of submarines attacking the other flank and put them off their stroke. At the same time the 12-inch guns of the monitors would be valuable in firing at long range at any cruisers or destroyers attacking the patrol. Lines of mines in-shore of the nets would, at certain tides, check any attempts to tamper with the nets. In this way I evolved a self-compensating scheme. The patrol protected the nets, and in their turn the nets protected the patrol; the destroyers protected the monitors from submarines, the monitors protected the destroyers; the mine-sweepers protected the patrol from mines, the patrol protected the mine-sweepers from gun-fire. It was really therefore, not a foolhardy project.

There was, of course, a grave danger that the Germans would rise at the insult of having such a patrol instituted under their very noses, and send an adequate force to rush the vessels. This was the right and obvious course for them to pursue. But, even in these early days, the conviction was gradually developing in my mind that the Germans never did do the right thing at sea. Again, what would the logical outcome of such an attack be? The approach of such a force would be observed and signalled, and my friend the gallant Commodore T.¹ at Harwich would be at sea within an hour. He could not save the patrol, but he could cut the enemy off if they tried to go north and bring him to action. That was always a consoling prospect. Or, if the Germans returned to Ostend or Zeebrugge, they would be hemmed in and find it difficult to escape, especially as a corresponding force could be spared from the Grand Fleet to help, so long as the enemy's ships were detached down south.

I was also certain that the monitors and the destroyers would leave their mark on the attacking force before they were sunk. So that, even if the worst happened, the enemy would not by any means have it all his own way. Again, most likely he did not realise that it took two minutes to load the 12-inch guns, with their old-pattern mountings, and also perhaps expected that the monitors carried more 6-inch guns than they did, and, more important still, he might credit them with more speed than they possessed. The summing-up of all these considerations led me to believe that the scheme was feasible and involved only risks which were justifiable in war. In addition to the other precautions, it seemed advisable to lay a deep mine-field to the north-westward of the patrol line, in daylight and in full view of the enemy. This served two purposes. It made the waters dangerous for a submarine swimming submerged, and, secondly, the enemy could not tell the depth of the mines, and therefore would think them dangerous to surface craft, or, at all events, would be chary of sending cruisers

¹ Then Commodore Reginald Tyrwhitt.

over them. They would, however, present no dangers to our vessels or those of Commodore T. at Harwich.

Having a clear vision of the problem, the Admiralty was approached and sanction obtained to institute the patrol; and the Stores Department, with the late Mr. M. M. Waller at its head, which never failed us in the war, took the supply of the nets and gear in hand.

A memorandum written early in 1916 explained the institution of the patrol. In it I stated the reasons for the proposed blockade, pointing out that the Belgian coast was entirely open to German sea traffic and transport and that vessels could pass from the German ports close to the Dutch coast into the Scheldt, or on to Zeebrugge and Ostend.

The Admiralty was reminded that it was impossible to maintain an efficient blockade off these ports on account of mines.

"A barrier of enemy's mines is laid parallel to the coast under the protection of gun-fire, which makes it impossible for our small vessels to approach the coast. Our larger vessels are similarly barred, and in addition outranged by the German shore guns, the range of these guns being 37,000 yards against our 20,000 to 25,000 yards. This, added to the immunity of shore guns from the fire of ships' guns compared with the vulnerability of ships to the fire from heavy guns mounted ashore, makes any attempt to approach the shore impossible. Nor is it possible, at present, to maintain any class of ship in the offing of these ports, since submarine mine-layers would make any such patrolled waters untenable, and submarines and locomotive torpedoes would add immensely to the risks involved."

I pointed out at the same time that observation of the ports, therefore, had to be carried out by aircraft only, and that such reconnaissance, although valuable, suffered from two defects. First, weather, and, especially cloud conditions, frequently prevented it altogether; and, secondly, the short duration of the periods of observation, and an entire absence of observation at night constituted serious handicaps.

And I added that I regarded the strict surveillance of this coast as necessary, in view of its proximity to the north coast of France, and the east coast of England, Ostend being only sixty miles from the Downs and twenty-four miles from Dunkirk. I admitted that it was easy to construct possible methods of a German invasion, but difficult to assess the practicability of these to the Germans without definite knowledge of their preparations. It was hardly likely that, in the event of invasion, the Belgian-German coast would be left out of use. At the same time I reminded the Admiralty that our naval forces had to be concentrated and based on harbours suitable to the size of our fleets in localities calculated to facilitate bringing the German fleet to action rapidly. These considerations entailed the bases being to the north, giving the Germans the same advantage of holding interior positions at sea that they held on land, and this advantage became accentuated since it only allowed us to keep a weak force on the southern portions of our east coast. In this connection, I stated :

“ If the Germans, therefore, took the majority of their fleet to the northward, and made a strong feint of invasion on our north coast from the Elbe, they would inevitably keep our main fleet in the north, whilst their real raid might come from the Belgian coast in shallow barges or other vessels, with a sufficient screen of cruisers to drive off our weak defensive mobile force. Such a plan would be more likely to succeed than one which involved transports sailing in company with, or screened by a fleet, with the hourly probabilities of a fleet engagement with a superior force.

“ It is not necessary to discuss the probability of such a plan, but with a shore base in direct railway, and especially canal, connection with the main German forces—which shore base is only sixty miles from our coast—it is evidently essential that this base should be thoroughly watched, and any sign of activity instantly communicated to the Admiralty.

“ This stretch of coast also contains two of the most troublesome submarine harbours, from which mine-laying submarines

and, now and again, torpedo submarines issue to raid our trade routes on the east coast and the English Channel. To close these harbours would necessitate an increase of 360 miles¹ in the round trip of submarines to the Channel, an increase not to be lightly disregarded.

"Again, operations against the vessels in these ports is impossible in day-time on account of the superior fire of the batteries, and night attack is impossible, as no accurate aiming-marks exist for night use. To bombard Ostend at night, under present conditions, would mean much loss of life to the Belgian population. With a permanent patrol, however, fixed lights can be installed and the docks fired on with considerable accuracy."

For all these reasons, I suggested the establishment of a permanent blockade on this coast, and I proceeded to discuss the proposal :

"To effect this, it is necessary to provide a patrol area off this coast immune from submarines, outside the range of accurate gun-fire from the shore, and to maintain on this patrol line monitors and patrol vessels in numbers and of sufficient armament to cope with any probable raid by destroyers and the smaller cruisers.

"To render an area immune from submarines, it is necessary to protect its boundaries below water. For this reason a zareba of mines, dangerous to submarines, must be laid out. As the submarine moves in a vertical as well as a horizontal plane, the defence must be of the nature of a wall, and mine-nets appear to be the most suitable means of effecting this protection. But, as little experience exists as to the feasibility of maintaining mine-nets, laid in the open sea, and subjected to moderate tides and at times considerable sea, it is advisable to supplement them with ordinary mines laid at depths at which submarines are likely to navigate.²

¹ As the boats would have to come from the Elbe instead of Ostend.

² A mine-net had its top floating on the surface of the water, and therefore was subjected to the wash of the sea. The meshes of the net exposed a considerable surface to the tide, and consequently a great strain was brought on the moorings. A mine was totally submerged and was not affected by the sea.

"As the patrol vessels are as likely to be attacked by submarines from the Elbe as by submarines from Ostend and Zeebrugge, and since, at all events at first, it will be impossible to deny these latter complete egress from these ports, it is necessary to protect the ships from the north and west as well as from the east, leaving the south open for communication with our own bases.

"If such a zareba can be maintained, we shall have placed our patrol vessels in a position to observe the coast, and to deny to a certain extent the use of the Belgian harbours to the Germans."

The extent to which these harbours were closed to the Germans depended, I proceeded to add, on the action of the Dutch, for the weak spot in the blockade was the strip of Dutch neutral waters, mainly represented by the Gat, which provided access to the Scheldt and then to Antwerp, and the shores of the Belgian coast. The Dutch should have denied the use of this water-way to submarines, whose sole purpose of leaving was to prey on the commerce-carriers of belligerent and neutral countries. Whether that duty would be enforced was, of course, a question of expediency, as Holland was the nut between the arms of the nut-cracker of the rival belligerents, and if one arm moved and the other remained firm, the nut would be cracked. "Which arm is most likely to move" would, in all probability, I suggested, determine Dutch action in respect of the Gat; but, in any case the round trip of submarines to the Channel would have been increased by 240 miles.¹

Another advantage of this position of a patrol, it was added, was that it would allow us to exercise surveillance over the waters to the west of the Flanders banks, and to the east of the old mine-field which had become a submarine run, and which, it was suggested, might be made unsafe for submarines. If that were done, then the safest passage for submarines to the

¹ By forcing the submarines up the Dutch coast instead of striking straight from Ostend to the English Channel across the banks.

English Channel would be close to the east side of the Goodwines or through the Downs, and the round journey would be increased by 240 miles. At the same time, the usual submarine passage to the English Channel would be rendered far more precarious, since we could strew the mine-field area with every abomination which submarines hate, and which we could not use in areas into which there was any possibility of our ships straying. And continuing, I stated :

"We shall, in fact, have established a temporary base of reasonable security, central between the entrance of the Scheldt and the mouth of the Thames, from which we can work patrols, and, in favourable weather, kite-balloons, and sea-plane observations.

"It is necessary to consider the risks attaching to the scheme. Nothing can be accomplished without risks. In this scheme there are two main risks: first, submarines, and second, raids from the Elbe. As regards the first, our greatest protection without doubt is that our enemy can never know our weakness. If our nets last, and we can keep them in repair, we are secure once they are laid, and even if we lose 50 per cent. of the nets through any cause, the enemy will not know this, and will not know which portion of the defence their boats can break through. The line we have to protect with nets from east, north, and west, is sixty-five miles¹ in length, and it is proposed to lay this in 500-yard nets, and alternate 500-yard gaps, so as to get the area defended quickly, and not to fill in the gaps until we prove the lasting power of the nets.

"One out of every two submarines attempting to break through should, by the laws of chance, be destroyed, and the Germans will have to lose only two or three boats to give up such attempts on our vessels, especially since, even if they do get through, they have our patrols to meet, and our sweepers will be ready to sweep any mines laid.

"The time taken to lay these nets will, it is hoped, not be more than three days, during which time we shall have to be specially careful; but again, as the enemy will have no real

¹ This estimate was considerably reduced subsequently.

knowledge of what we are doing, and since the German Navy is thoroughly imbued with military principles which enjoin reconnaissance and accurate dispositions, such as are possible ashore, and is not by heredity imbued with naval instincts, which recognise the impossibility of accurate sea dispositions and forecast, but which usually enjoin instant action, they will probably wait to reconnoitre our actions, thus giving us time to get well on with our defence before an attack is attempted. The first three days and nights, however, will be anxious and will necessitate vigilance.

"After this, if the nets hold till the Germans have lost three boats, we shall be tolerably secure. Even if we have to abandon the patrol through weather conditions, the enemy will not dare to approach our defences in such weather, and any attempt to destroy them without care and caution, which mean time and delay, will be costly and dangerous to him."

As regards raids from the Elbe—I suggested that if they were undertaken by destroyers and small cruisers, the three monitors on patrol, with their 12-inch and 6-inch guns, supported by others from Dunkirk, would prove formidable antagonists, while our mine defence would be effective against them as well as against submarines, and keep them a reasonable distance from the monitors. The Harwich Flotilla also would represent a real danger to the enemy, and, by making him anxious as to his line of retreat, tend to make such raids hurried and ineffective. If a large cruiser was sent to support such a movement she would stand in peril of our deep defensive mines and be in danger of herself being cut off. It might, therefore, be assumed, I added, that, although my proposals entailed risks, the risks were not incommensurate with the objects to be attained. Finally, I pointed out :

"It is evident that, since the patrol will be carried out by the vessels of the Dover command and French destroyers at Dunkirk, supplemented, when possible, with a division from Harwich, the Dover Patrol will be somewhat depleted of patrol vessels, but the protection of the Channel will be better

effected by meeting the submarine boats off the Belgian coast, denying them the passage of the Flanders banks, and operating against them in the less strong tidal waters in the vicinity and immediately west of these banks, than by allowing them to enter the swift Channel tides which assist them greatly by handicapping our nets and other catching appliances. Moreover, so far as reconnaissance and scouting for the approach of an enemy's fleet from the North Sea is concerned, our line of observation is advanced forty miles to the N.E. of the Narrows of the Channel, an incalculable advantage in giving time for the disposition and warning of our submarine boats.

"Any attempt to use the Belgian coast as a jumping-off place for invasion will be stopped permanently.

"The patrol, if it proves feasible in practice, will entail much strain on the captains and crews of all the vessels concerned, and an unceasing vigilance which no previous blockade has ever required; but, from my knowledge of the arduous and incessant work in bad weather that the officers and crews of the boats of this patrol have accomplished during the past winter, I am convinced that no failure will result from that cause."

These quotations reflect my views at the moment. The actual amount of nets mentioned and the economy in their use, by leaving gaps, were only estimates, but we went ahead with the scheme.

The Drifter Patrol now set to work in earnest to prepare the nets. The first jump was fixed at fifteen miles of nets with their moorings, mines, and batteries, the preparation of which involved considerable labour; but they were worked at by day, and part of the night, Sundays and week-days, till they were completed. The operation of laying was one that required much thought. Time was of much moment, as it was highly desirable that the enemy should not appreciate what we were doing until the work was done. It was, however, to our advantage for them subsequently to consider this area dangerous to them. Observation, therefore, on their part was desirable.

The mines and mine-nets had to be laid as one operation on account of the difficulty of marking accurately the positions of the mines when laid and laying nets subsequently abreast of them. It was evident that the ships which had to lay the mines could not do so safely inshore of the nets, after once the latter were laid. Nothing could be done in advance in the waters in which we were going to operate. The navigational buoys by the Ratel and West Hinder had to be laid that morning, as the slightest previous activity in those waters might have aroused suspicion.

To mark the line of nets for our patrol by day and night, and also thoroughly to mystify the enemy, I arranged to lay light-buoys the whole length of the mine-field, since the Germans were sure to take time to think what on earth these meant, and give us an opportunity to complete our defence.

The planning and laying of the barrage, indeed, was a work of great interest. A number of varied operations had to be effected, some simultaneously, others in sequence, and these considerations, apart from the multitude of vessels employed, and acting mostly independently, made attention to minute detail a necessity. It was exactly the class of operation which was necessary to test our ability to plan and issue orders incapable of mistake, and our eventual success increased the confidence of my staff and myself, and never for one moment afterwards did I hesitate in planning any operation in conjunction with them, however intricate at first it might appear to be.

In those days we had no taut wire-gear,¹ otherwise the suit we fitted to the Belgian coast would have been a perfect fit. As it was, it was a good one, but one leg was a trifle long owing to tide, as will be explained later.

In the first place, it was necessary to re-survey the passages between the shoals off Dunkirk, and mark with buoys and drifters those passages to be used by the mine-layers, as the *Orvietto*, the largest mine-layer, was a heavy-draft ship.

¹ See Chapter IX.

During the laying the chief danger to our vessels appeared to be an attack from mine-laying and torpedo-carrying submarines, and more particularly homing submarines with torpedoes. During the first day's operation, before the complete defence could be placed, the whole of the patrol would be open to attack by submarines from the northward and westward. Special precautions were, therefore, taken, and a temporary line of drift-nets was laid to flank the western side of the patrol. Also a line of dan-buoys¹ was moored to the northward to deceive aircraft into believing that mines were laid in their vicinity.

At 4 o'clock on the afternoon of April 23rd, 1916, the mine-layers *Orvietto*, *Princess Margaret*, *Biarritz*, and *Paris*, under the command of Captain F. S. Litchfield-Speer, left the Thames, escorted by two divisions of Harwich destroyers, and proceeded through the Downs to the Dyck Light Ship, up the recently surveyed and buoyed channel, and arrived at a marked position at the end of the outer Ratel Shoal at 4 a.m. on 24th. They then proceeded to the spot marked A on the chart, Plate XVIII, and laid a double line of mines from this position to the point marked B—two and three-quarter miles from the Thornton Ridge—and from there they ran to the point C. On the port beam of the mine-layers, the destroyers *Zulu* and *Nubian* ran dropping dan-buoys every three miles and one mile respectively, to mark the position for the light-buoys to be moored and the mine-nets laid. By this means the relative positions of the mines, mine-nets, and light-buoys were co-ordinated. Immediately after the mine-layers, the Trinity House vessels, *Vestal*, *Argus*, and *Alert*, followed to lay the light-buoys. Then came the 5th and 7th Divisions of net-drifters to lay the mine-nets, and the mine-laying trawlers to complete the eastern arm of the mine-field from C in towards the shore, where the water was too shallow for the mine-laying ships. The

¹ The dan-buoy is the mark-buoy—a particularly visible one—used by drift-net fishermen to mark their nets.

monitors *Prince Eugène* and *General Wolfe* acted as supports to the destroyers, which guarded the various units at their work. The procedure of the mine-net drifters was simple. As each division arrived at its mark-buoy, the rear boats proceeded to shoot their nets, and, after steaming a definite time interval, each succeeding pair stopped and shot their nets to complete the line.

In addition to the above, the 10th, 11th, and 12th Divisions of net-drifters anchored parallel to the West Hinder and shot their nets. These were to form the protection to the western flank of the patrol line. The 9th Division anchored in extended order on the Raabs Shoal, but did not shoot their nets, so as to be ready to weigh quickly, in case of attack, as their position was an exposed one. Their presence was intended to convey to enemy submarines the impression that nets had been shot in this position, thus closing the north end of the area to attack, when of course in reality it did nothing of the sort.

By 7.30 a.m. the mines had been laid and the mine-layers and their escort left for Sheerness. Several attacks were made on the vessels by aircraft. At 11.30 a.m. Flight Sub-Lieutenant Suir and Sub-Lieutenant Furness in a Nieuport Clerget, brought down a German sea-plane, which blew up on striking the water. At 2 p.m. a heavy explosion occurred in the mine-field, caused, it was hoped, by a submarine striking a mine. At noon a submarine fouled the drift-nets of the *Arndilly Castle*, and was destroyed by a depth-charge dropped by the yacht *Diane*. At 12.40 p.m. the Tirpitz Battery straddled the *General Wolfe* at 32,000 yards range with four salvos. At 2.15 p.m. a submarine fouled the drift-nets of the drifter *Gleaner of the Sea*, and was destroyed by hand-bombs; but to make certain, she was attacked by the *Afridi* with her explosive sweep.

When laying the eastern leg of mines from B to C, the tide was rather stronger than was expected, and the end buoy of our line was laid just inside Dutch territorial waters. At

2.30 p.m. two Dutch torpedo-boats arrived to ask our intentions and to protest against the violation of their waters. They were given two pieces of information—first, that I was sorry we had strayed into their waters, and, secondly, that they were in the middle of a very dangerous mine-field. This information apparently satisfied them; we piloted them clear, and they made off and wisely did not venture out again.

At 2.55 p.m. three enemy T.B.D.'s were sighted off Zeebrugge, steering N.E. The Harwich destroyers *Medea* (Commander Valentine F. Gibbs), *Melpomene* (Lieutenant-Commander Hubert De Burgh), and *Murray* (Lieutenant-Commander H. Taprell Dorling), and engaged them with the usual gallantry of the destroyers under Commodore Tyrwhitt. The *Milne* (Lieutenant Hugh R. Troup), joined them shortly afterwards. In the ardour of this pursuit, and owing to the fact that I had omitted to warn the Harwich boats not to venture near the shore on account of the batteries, when at 16,000 yards from the land they came under the fire of the batteries, with the result that the *Melpomene* was hit in the engine-room below water by a shell, which fortunately failed to explode. The other boats were also hit. The *Milne* and *Medea* proceeded to take the *Melpomene* in tow. They were observed by the German boats, which again came out to the attack. The *Medea*, therefore, slipped, and, with the *Murray*, gave fight, and the monitors came to the rescue with some well-directed 12-inch rounds, which drove the enemy again inshore, and the *Melpomene* was towed out. Why the shore batteries ceased firing goodness only knows. They should have made a good bag of destroyers if they had gone on. The whole episode was a piece of fine, cool destroyer work, aid being given to one another under fire at the right moment, and a firm front shown at the same time to the enemy. This was our first experience of the German destroyers, and we learned, what afterwards we were to experience on the coast, that the greater elevation of their guns

enabled them always to outrange our boats. Also, we found out that they mounted more 4-inch guns than did our boats.

An unfortunate accident occurred to one of our drifters, the *Clover Bank*. She laid her nets all right, and then, losing sense of direction, steamed to the southward instead of to the northward, and dropped the moorings of the battery box among the mines which had just been laid by the trawlers, and almost immediately struck a mine and was blown up.

At 4.30 p.m. the crew of the drifter *Glen Afton* saw the wake of a submerged object enter the line of mines and immediately afterwards a heavy explosion occurred—another submarine, we hoped.

I had arranged to divide the patrol into two halves, each consisting of one monitor and a destroyer escort, to patrol by the Thornton Ridge, and the other half-way from that shoal to the end of Cliff Island Bank; but, as two of the Harwich boats were out of action and two others holed, the patrols were united and worked as a single unit for the night. As I saw more destroyers would be required if a night patrol was to be kept up, I turned the patrol line over to Commodore Johnson, and left for Dover to telephone personally to the First Sea Lord, Sir H. Jackson, intending to return at once to the patrol. On arrival, I found orders to withdraw the whole patrol as the enemy's ships up north were reported to be at sea. This was a bomb-shell, as it gave time for the enemy to investigate our net barrage without interruption. The 9th Division of drifters at anchor on the Raab failed to receive the order to withdraw, and remained there for the night. They reported a very heavy explosion at 1 a.m., in the short line of nets laid to the N.E. of them, and a double explosion at 2.45 a.m., both of which appeared hopeful.

So ended April 24th. We had laid in that day a double line of mines fifteen miles in length; thirteen and a half miles of mine-nets were moored, of which eleven miles had been made active; fourteen large light-buoys and several other

marks were laid ; we had reason to hope that certainly four, and perhaps five, enemy submarines were destroyed, and one seaplane was brought down, while a protection of eighteen miles of drift-nets had been provided. Our losses were one officer and seventeen men killed, and two destroyers temporarily out of action. The French destroyer *Obusier* strayed into our mine-field off the north end of the Cliff Island Bank, and got badly damaged.

Next morning the 9th Division of drifters found themselves quite alone. At 6.15 Commander George W. C. Venn, R.N.R., who was in command, weighed and stood to the S.W. to join the patrol. Now followed an extraordinary occurrence. As these six little drifters steamed right down the patrol line they saw enemy destroyers, who gave chase and fired at them. One drifter, the *Au Fait*, was hit and captured, the others continued their course and arrived safely at Dunkirk. A full account of this incident is given later on. As the patrol had been withdrawn by Admiralty order, there was no help within twenty-five miles.

Our air reconnaissance, carried out the next day, reported a force of eleven destroyers, three small cruisers, and a sea-plane-ship off Zeebrugge. It was, therefore, desirable to impress the enemy with a false idea of our strength. Having obtained Admiralty approval for the co-operation of Commodore T. of Harwich, a demonstration was arranged for the same day as that on which it was proposed to lay the deep mine-fields to the N.W. On April 28th, 1916, therefore, I met the *Cleopatra*, flying the pendant of Commodore Tyrwhitt, off the outer Ratel Bank. The arrival of the mine-layers and their escort was timed so that we all should reach the S.W. Hinder Buoy at the same time. With the Harwich force, we were able to parade a force of two cruisers, two flotilla-leaders, thirty-two destroyers, and four monitors. The northern deep mines marked 7.7.7. were laid¹ and, having patrolled within

¹ The German seaplanes watched the mine-laying and reported the number laid by W.T., which was exactly what we wanted them to do.

full sight of the enemy's aircraft up and down the patrol line, the force broke up.

Four destroyers were lent by the Admiralty from Harwich to act as a support to the patrol line,¹ so that a daily patrol was established of eight destroyers,² two monitors, and one flotilla-leader or cruiser, and a night patrol of two submarines. This was continued till the mine-laying and net-laying was completed, after which the patrol was halved, and the two halves worked on alternate days.

On May 3rd and 5th further mines were laid till the whole defence as shown in Plate XVII was completed. On May 5th aircraft reported that the nets abreast of Nos. 8 and 9 buoys were disarranged, and a large area of water was covered with oil. The *Lord Clive* also reported streaks of oil extending the length of the patrol line, so without doubt one of the enemy's vessels came to grief. On May 5th and 6th the enemy attacked the light-buoys, and on the night of May 5th-6th sank Nos. 3, 5, 6, and 16 buoys, and at the same time broke several of the glass floats that supported the heads of the nets; this made little difference to their efficiency, as, after sinking a few feet, they would come to rest and be as dangerous as ever to submerged craft.

On May 7th the whole of the net defence was finally completed. Steps were at once taken to provide spar-buoys in lieu of the light-buoys, and these were laid one mile to the west of the nets, as shown in Plate XVIII. These spar-buoys were practically unsinkable. The French destroyers under Admiral De Marliave rendered valuable assistance throughout these operations.

The above description of the operation has been given at some length, as it affords a bird's-eye view of the work on the patrol line, which continued until October 10th, 1916—net replacing and mending, and scrapping with German destroyers

¹ These destroyers were lent on the condition that they did not go on patrol either on the Belgian coast or in the Channel.

² About half of these were armed with 12-pr. guns only.

at long range—for the beggars would never come right out and fight—being our frequent experience.

The following memorandum was issued on May 10th, 1916 to the patrol to explain why the monitors were on patrol.

“The position occupied by the 12-inch or 15-inch monitors on the patrol line requires explanation.

“The primary object of these vessels is to provide a rallying-point for the destroyers in case of attack by a superior force. The patrol line obviously should be defended against attack, even if superior forces are brought against it, and only deserted when such defence becomes impossible. I have in a previous memorandum dealt with the procedure to be adopted when such action becomes necessary.

“In laying down any line of action in war, due consideration must be given to the factors which will probably govern the action of the enemy. To argue merely on the possible, rather than the probable, action of the enemy is useless ; the result is inevitably to forge bonds which serve only to restrict the useful action of our own ships.

“The raid on our patrol line may be of two descriptions :

“(a) Large cruisers and smaller vessels.

“(b) Small cruisers and destroyers only.

“The former is not for the moment probable, at all events not till the latter has failed.

“The Germans, of all nations, have nothing to gain in risking capital ships on subsidiary operations. The puss-in-the-corner game at Lowestoft savours more of a sea cruise than a war operation, since the time in action has to be limited to an absurdly small amount.

“The waters near our patrol are known by the Germans to be mined. The shoals are dangerous. The distance we are from Terschelling,¹ is the same as they were from Lowestoft, but, to inflict damage on our patrol, the time of stay must be longer. It is highly improbable that an attempt of this sort with capital ships, which carries with it no spectacular effect, would be attempted.

“The second case of a raid by destroyers and small cruisers

¹ On the north-east corner of Holland.

is more likely, and most probably such vessels would issue from Ostend. Again, to a careful Navy, imbued with military ideas, it is doubtful if hammering a monitor with 6-inch guns would compensate for the risk of a small cruiser being hit by 12-inch projectiles. It is not the class of action which appears to be in favour with the enemy. If they appreciated all the weak points of our monitors as thoroughly as we do, they might attempt such an attack; but, as they cannot know these, the attack is not a likely one. They probably know our monitors have 6-inch guns, but not their range; moreover, a monitor should stand a large amount of 6-inch hitting at long range¹ without being put out of action, and mere hitting brings no spectacular credit to the German.

"It is, therefore, unwise to credit the Germans with a line of action which they probably do not meditate, since to count such a possibility as a probability would glue our monitors to the neighbourhood of No. 3 Buoy. Their function is to protect the patrol, and drive off the small cruisers if possible, regardless of the very off chance that a deliberate attack has been planned on them by the small cruisers.

"It must always be remembered that, if the cruisers engage our monitors, they cannot at the same time attack our destroyers, so that, by engaging these cruisers, the monitors relieve the pressure on the destroyers, and, sorry as I should be to have a monitor disabled, I would be still more sorry to lose three destroyers."

What I really feared was that the enemy might try to attract our destroyers away from the monitors and deprive them of the support of the latter, crushing them with superior numbers. I knew that our boats would be off racing like hounds after any destroyers seen inside the patrol line, and might be enticed, I thought, many miles away from support and be cut off. Destroyers were, therefore, strictly ordered never to be out of sight of the monitors—especially in the

¹ The monitors, owing to the nearness of their bottoms to the water-line, were more vulnerable to long-range fire than to the same projectiles at close range, since to obtain the range the projectiles had to be fired at a considerable angle of elevation and, therefore, descended on to the ship at a correspondingly greater angle.

early morning mists. Once the enemy did try this, and sent one half of his destroyers to the S.W. end of the Hinder and kept the other half by the Thornton ; but, as our vessels were well in hand, they gave up the attempt.

Now, the subsequent history of the big light-buoys has its comic side. They were laid to mystify the enemy, and for a fortnight he did nothing. Then he sent sea-planes in the early morning to sink them by machine-gun fire. We gradually replaced the light-buoys with spar-buoys. But certain buoys he never attacked, such as the S.W. Hinder and Nos. 10, 11, 12, and 13. Evidently, therefore, they were of use to him. So we sank them ourselves !

Experience showed that it was impossible to work the nets running from No. 10 buoy inshore, on account of the Knocke Battery ; these were therefore abandoned, and an extension of the mine-field was laid by No. 11 buoy and to the north-eastward of the Raabs.

The work done by the patrol and its strategical effect on the Straits of Dover in 1916 can be summed up as follows:

All mining ceased instantly in the Dover Straits.

From an average of one mine-field every five days off the English coast of the Dover area, not a single mine was laid for five months and three days.

On the French side mining was not stopped so completely. Mining occurred on May 16th, but further mining was stopped by an extension of the explosive nets laid down the side of the East Dyck Bank. Mining again occurred once in July and once in September.

The following figures indicate the value of the barrage.

		English Side.	French Side,	Total.
Moored mines destroyed in the five months immedi-				
ately preceding the barrage	143	100	243	
During the five months that the barrage was main-				
tained	0	54	54	
<i>Two</i> months after withdrawing the patrol . . .	17	54	71	

From May 1st to October 10th, 1916, a continuous day patrol

was kept up with very few omissions by the monitors, destroyers, mine-sweepers, and other vessels and constant repairs were carried out to the mine-nets. Our submarines carried out the patrol at night-time. This involved much hard work for the officers and men of all the ships and vessels, but the varied duties were most ably carried out.

While the patrol was in force twelve submarines were attacked on different occasions by the destroyers or ships.

The day patrol was out for 144 out of the 163 days, and our submarines were out for 112 nights. Repair work to the nets was carried out on fifty-eight days to fifty-four miles of nets.

The patrol was attacked twenty-eight times by aircraft in numbers varying from one machine to fifteen machines.

On nine occasions the enemy destroyers were attacked by our destroyers or monitors.

On three occasions the patrol was fired on by the Knocke or Tirpitz batteries. The *Prince Rupert* was straddled by the Knocke Battery at 34,000 yards, and had her engine-room lights put out.¹

Just imagine the insult of having a patrol of this nature established off one's coast!

In the early days of the barrage, whenever the German destroyers were reported out, I used to go in a destroyer full speed to the patrol line, as it was uncertain what such activity might mean. On the first occasion, as we neared the patrol vessels, intercepted signals showed that our destroyers were engaged. An intercepted buzzer conversation between the monitor and the *Amazon*, Commander Oliphant, was both amusing and reassuring, as showing that our boats were quite happy regarding the scrap in which they were engaged. "That last salvo was rather close, was it not?" buzzed the monitor. "Yes," replied the *Amazon*, "it took my sub's cap off, but luckily it was an old one, so it did not matter!"

One other tale which caused amusement was told of one of

¹ See Plate XIX.

the monitors, which had a very livery, and none too skilful cook who rarely put himself out to oblige the ship's company. He instituted a strict rule that no dinner would be received in the galley for cooking after 11 a.m. A hopeful ordinary seaman one day blew into the galley at five minutes past eleven with a lovely sea-pie beautifully decorated. "Too late," said the cook, "I can't cook that." Visions of hunger and the anger of his mess-mates sharpened the satire of the youthful seaman, who, seeing he had a clear line of retreat, blurted out, "Oh! I know you can't, Cookie, but you might give it its time!"

The weather towards the middle and end of October was such as to preclude the chance of keeping the monitors on the patrol line. The danger to these vessels was considerable. Gales of wind from the S.W. sprang up without much warning, and on one occasion the *Prince Rupert* was caught, and had to steam with both anchors down to prevent drifting stern first up the patrol line. The horse-power of the monitors was small, and their speed fell rapidly in any sea. Moreover, the tides were strong. The nets could not be attended to except in fine weather, so that there was no help for it but to discontinue the patrol.

The cross-Channel barrage from the Goodwins to Snou Bank occupied all our available net resources till well on into the spring of 1917. The want of success of that obstruction in stopping mining again led me to attempt the coast patrol—more particularly as, with the Great Landing imminent, it was of importance to have the waters off the coast swept and under our control. Also, as the Germans had defeated our daylight bombardments by working a sea-plane patrol in the early morning, to give them warning to start their smoke-screen, the constant presence of 15-inch monitors on patrol gave a chance of surprise firings at Ostend and Zeebrugge.

Early in 1917 German mine-sweepers were observed to be working on an area between the end of the Outer Rate and the Middelkerke Bank. This could have but one meaning,

and that was that they did not want mines in that locality. Steps were therefore immediately taken to lay some in this position, as it was not one likely to be used by our vessels. Six destroyers were used with an escort of three other boats under the *Botha*. The laying was simple, the boats being in line ahead. The rear-boat dropped first, and, on dropping her twentieth mine, turned four points to port and signalled her next ahead, who commenced to drop her lot, the rear boat continuing to drop the remainder of her mines on the new course. The second boat from the rear altered four points to starboard on dropping her twentieth mine, and so on. By this method the distance apart of the boats was covered by the mines laid on the four-point course, and no gaps were left; at the same time no danger was incurred to the boats laying. Each boat, on completing, steered one mile outwards, clear of the line, and then turned and proceeded independently to Dunkirk. A light-buoy as a jumping-off buoy had been laid during the afternoon at the end of the Ratel.

All went well except that the *Tarpon* struck a mine, possibly one that the German mine-sweepers had missed. She was, however, got safely into harbour.

This method of laying was quite sound for the particular locality, as the distance to our own waters was short, and, therefore the boats, steaming back independently, were safe from attack by superior numbers of the enemy; but it would not have been a good method for vessels working at a greater distance from Dunkirk.¹ Exactly why the Germans wished that area clear was never definitely determined, but I believe it was to provide a firing-point for destroyers and light cruisers to enfilade our lines at Nieuport, in case of an advance on the coast. So far as we know, no attempt was made to clear the mines after they were laid.

The following memorandum, prepared on July 5th, represents my reasons for reinstating the Belgian coast barrage.

Compare this method with that used to the N.E. of Thornton Ridge, page 175.

"I consider it very advisable to reinstitute the barrage.

"It is unwise to commence operations which necessitate the command of the water off that coast without previously holding those waters.¹ Not only should their condition as regards mines be ascertained, but officers in command of boats and other vessels should become accustomed to working on the marks and among the shoals. This accustomedness can only be gained by daily habit.

"Last year no one liked the prospect of the patrol in the changeable weather that is experienced off the coast, but in a short time they would just as soon run about among the shoals and nets in thick weather as anywhere else. When I start operations I do not want the officers to be entirely obsessed by navigational worries.

"Again, we should establish ourselves in the offing before transporting troops in numbers. Though not likely, still it is possible that I may have to maintain sea communication with the troops landed for forty-eight hours after landing them, as during that time land communication with those units may be impracticable. We must be prepared for the worst and we must hold the waters by day as well as by night.

"It seems as if, with a very small temporary reinforcement, I could start the old barrage about the 25th inst., and keep a constant patrol, exercising care and caution.

"The force would be, two 15-inch monitors, one *M.* monitor, two flotilla-leaders, nine destroyers, six paddle mine-sweepers. In the event of a superior cruiser force being sent down, the 15-inch monitors could do a lot of covering, and the lighter vessels could retire down the A channel² until reinforced. The barrage nets would be laid in three jumps. On each of these occasions special precautions would be taken. Deep mines should be laid in daylight in the early morning, so that the enemy may see, but not know their depth. Mine-laying destroyers should also work and lay fixed-mooring-rope deep mines. The Germans would never know exactly what we had done in the way of mining, and would, as is always the case, imagine the worst.

"If this programme were carried out, it is doubtful if they

¹ This refers to the Great Landing on the Belgian coast then projected.

² The normal approach to Dunkirk from the patrol line,

would ever send any light cruisers inside the patrol area, and it is equally doubtful, as Ostend would be under our gun-fire, and Zeebrugge decidedly unhealthy,¹ if they would take any vessels between the barrage and the shore.

"Mine-laying might take place inside the patrol area, but we could always sweep a passage up past the navigation buoys and have exploratory sweeps elsewhere.

"Of course, the barrage looks very easy to destroy, when merely the chart is consulted; but try, as I have often done, to pick up the barrage *in situ*, steaming in slowly, looking out for the buoys,² in a tide, and I can tell you that you are just as likely to sight them alongside as 200 yards off. It is impossible to go near the nets at night, and in daytime the destroyers should 'down' any craft trying to tackle them; besides which, the barrage is an extremely awkward thing to tackle, even if the attempt was made without interference.

"I have no fears that the Germans will have more success in tackling it this year than last year, especially as they will be full of other thoughts, and will have to prepare special gear for the work. Nothing succeeds with the German like a surprise, and bounce can be mixed with it without their finding out the fraud. They are very cautious people.

"Look at last year. With a patrol of four Tribals, two 12-inch monitors, one *M.* monitor, and one light cruiser, we kept the patrol right up to the bad weather period, although the enemy had always twelve good boats and any number of submarines. The west approach of the patrol line was always open to them, but they never mined it, and only once sent a submarine to attack our force, and that failed.³

"A force of four Harwich boats and a light cruiser were kept at Dunkirk as a reserve, but were not allowed by Admiralty order to be used on the patrol line except to support,

¹ The range of the 15-inch monitors was considerably greater than that of the 12-inch monitors that had done the patrol the previous year.

² Fishermen's small floats to support the upright wires of the nets.

³ I believe our deep mines laid openly in 1916 were responsible for this immunity. The Germans knew the approximate position of those mines, but what worried them was not knowing how many more lines had been laid in other places which they had not seen being laid. As a matter of fact there were none.

so they could hardly, with an hour's hard steaming, be looked on as a deterrent to the enemy to attack our boats.

"This year I anticipate it will be much the same. For three days after laying the barrage, the Germans will do nothing, and, if we have the same luck as last year, and catch one or more of their boats homing on the morning of the jump, they will not do anything for a fortnight. Next, they will have to try to determine the extent of our nets, and, while doing this, they will observe our mining of the back area going on. This will choke them off still more. They will for a period keep their mine-laying submarines in harbour. When they think they have discovered the limits of the barrage, they will see further operations of net-laying going on, which will upset them again. In the meantime, Ostend and Zeebrugge will be annoyed by intermittent shoots which will bring home to them how unsuitable these places are for light cruisers. While this is happening, time will be passing, and they will find it difficult to decide whether it is safe or not to bring cruisers down off the coast.

"It is the old point which has always brought us success, namely, *we know what we are doing and what we have done, and the enemy do not know what we have done for certain, or what we are going to do*, so all the advantage lies with us. He is full of uncertainty, and finds it difficult to make up his mind, as *he gives us credit for having done what, under the circumstances, he would do, as well as what we actually have done*, and the general result is that he does nothing." |

On July 25th, 1917, the net barrage was again laid off the Belgian coast. The necessary material had been scraped up, thanks to the exertions of the Stores Department of the Admiralty—all in addition to our heavy demands for the cross-Channel barrage. Much the same procedure as in the previous year was followed, but the laying had so far improved that the *twelve miles of nets were laid in one and a half hours*. Admiral Ronarc'h, Admiral de Marliave's successor, was with me in the *Broke* to witness the laying.

German destroyers came out and fired on the drifters, but the

Terror and *Broke* and the *Nimrod* with her division of destroyers drove them off. Our destroyers were, on this occasion, not allowed to chase inside the net-line, as the enemy would merely have repeated their tactics of the previous year, and tried to draw them in under the batteries. Moreover, steaming fast raised a sea which would have disturbed the drifters at their laying. It always looked tempting to chase, but it was a useless thing to do. One submarine was reported as having fouled a net and blown up on a mine, but the direct evidence was not so strong as to amount to a certainty. The remainder of the nets were laid on the 27th, and a daily patrol started.¹

The nets were laid one mile to the westward of the old net-and-mine line so as to be clear of the mines laid in 1916.

The enemy evidently had learned a good deal from the previous years, as attacks on the nets by sea-planes were more systematic ; several battery cases were sunk, which led to our placing the batteries inside mine cases and sinking them to the bottom—an effective, but, to us, inconvenient procedure.

As the 12-inch monitors were all up the Thames preparing for the Great Landing, the patrol had to be taken by the *Erebus*, *Terror*, and *Soult*, with the small monitors and such destroyers as could be spared. The bombardments have been dealt with elsewhere, but the net result was that Ostend was abandoned as a destroyer base, and Bruges henceforth became the port of the Belgian coast.² Aircraft were very active.

The only marked difference on the patrol line in 1917, as compared with 1916, was the increase in the range of the shore batteries, due to the use by the enemy of elongated shell, and the introduction by him of motor-boats electrically controlled from the shore.

The introduction of these craft was typical of the manner

¹ The 1917 barrage is shown in the General Chart of the Patrol

² As Bruges was eight miles inland, this must have inconvenienced the enemy considerably.

in which a new idea was given uselessly away by the enemy. The first knowledge we had of the existence of these boats was when one of them ran into the pier at Nieuport. The explosion was described by the French as "acharnant." It did no damage, and sufficient fragments of the machinery were recovered to give away the principles of the design.

These electrically-controlled motor-boats used on the Belgian coast were twin petrol-engined vessels partially closed in; they travelled at a very high speed. They carried a drum with somewhere between thirty and fifty miles of insulated single-core cable, by which the boat was directed electrically. The fore part of the boat carried a considerable charge of high explosive, probably from 300 to 500 lbs. in weight.

The method of operating was to start the engines, after which the crew left the boat. A sea-plane protected by a strong fighter air-patrol then accompanied the vessel at a distance of three to five miles, and signalled to the shore operator the helm to give to the vessel. These signals needed only to be—starboard, port, or steady. The boat zigzagged while running. This may have been intentional or unintentional. On being steered into a ship, the charge was exploded automatically.

The device was an old one; a boat similarly controlled was used in H.M.S. *Vernon*, the torpedo experimental ship, in 1885. The only new features in the German boat were petrol engines and W.T. signals, neither of which existed in 1885.

In sending a description of these craft to the Admiralty, I remarked that the danger incurred by our vessels on patrol was not of much account. In fact, it was, to a certain extent, an assistance to the Belgian Coast Patrol, in that the presence of these boats ensured a constant vigilance, which it is difficult to maintain without a recurring cause. It also provided a high-speed target for the guns of our vessels, a class of target most difficult to obtain normally, and it was therefore much appreciated by us.

There were methods of using this class of vessel which might annoy us, such as attacking our vessels at anchor off



THE "PRINCE RUPERT" BEING SHELLED BY THE WILHELM II BATTERY
AT KNOCKE, AT A RANGE OF 17 MILES.

The maximum range of the *Prince Rupert*'s guns was 10 miles.



MONITORS AT SEA.



ELECTRIC MOTOR-BOAT EXPLODING AGAINST THE BULGE OF H.M.S. "EREBUS,"

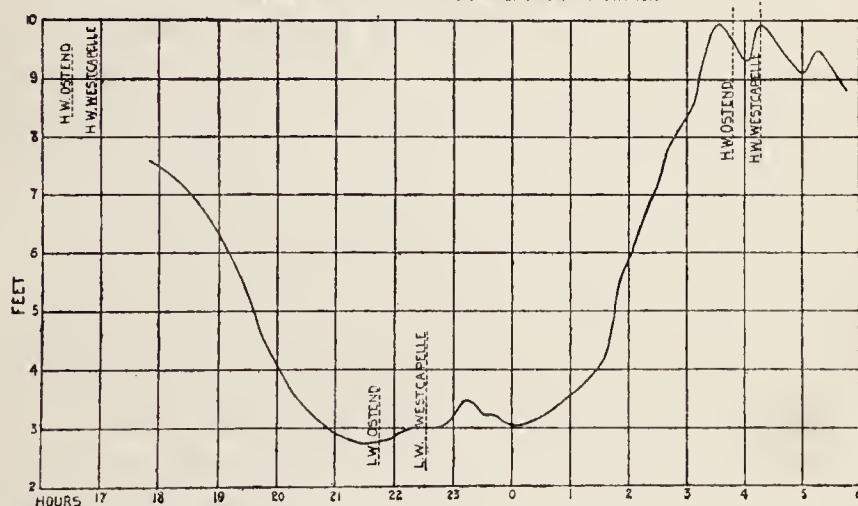
Dunkirk; but they were not tried. Although low in the water, the "feather" caused by travelling at speed gave ample warning of its approach.

On the first occasion that one of these boats was run at the fleet it was sunk by *M. 24* (Lieutenant-Commander St. John). This initial success probably led to this class of vessel being treated with too much contempt. The second attack on the ships on patrol failed, the boat for some reason not getting as far as the patrol vessels. The third attempt

TIDAL CURVE FOR N°81 BUKY BELGIAN COAST

(LAT $51^{\circ} 30' N$ LONG $2^{\circ} 50' E$)

OBTAINED BY H.M. SUBMARINE C.17 ON 21-22 SEPTEMBER 1917



was successful on October 28th, the *Erebus* being struck fair amidships. Several casualties resulted—two killed and fifteen wounded—from the débris thrown about by the explosion, and Captain Charles S. Wills suffered considerable damage to his ears from the concussion. The *Erebus*'s bulge only was damaged, the ship not leaking at all.

The success of this attack, so far as obtaining a hit was concerned, necessitated increased vigilance on the part of the patrol. Consequently I issued a memorandum which, being

of passing interest only to naval officers of that period. I have not quoted here, but it will be found in Appendix III.

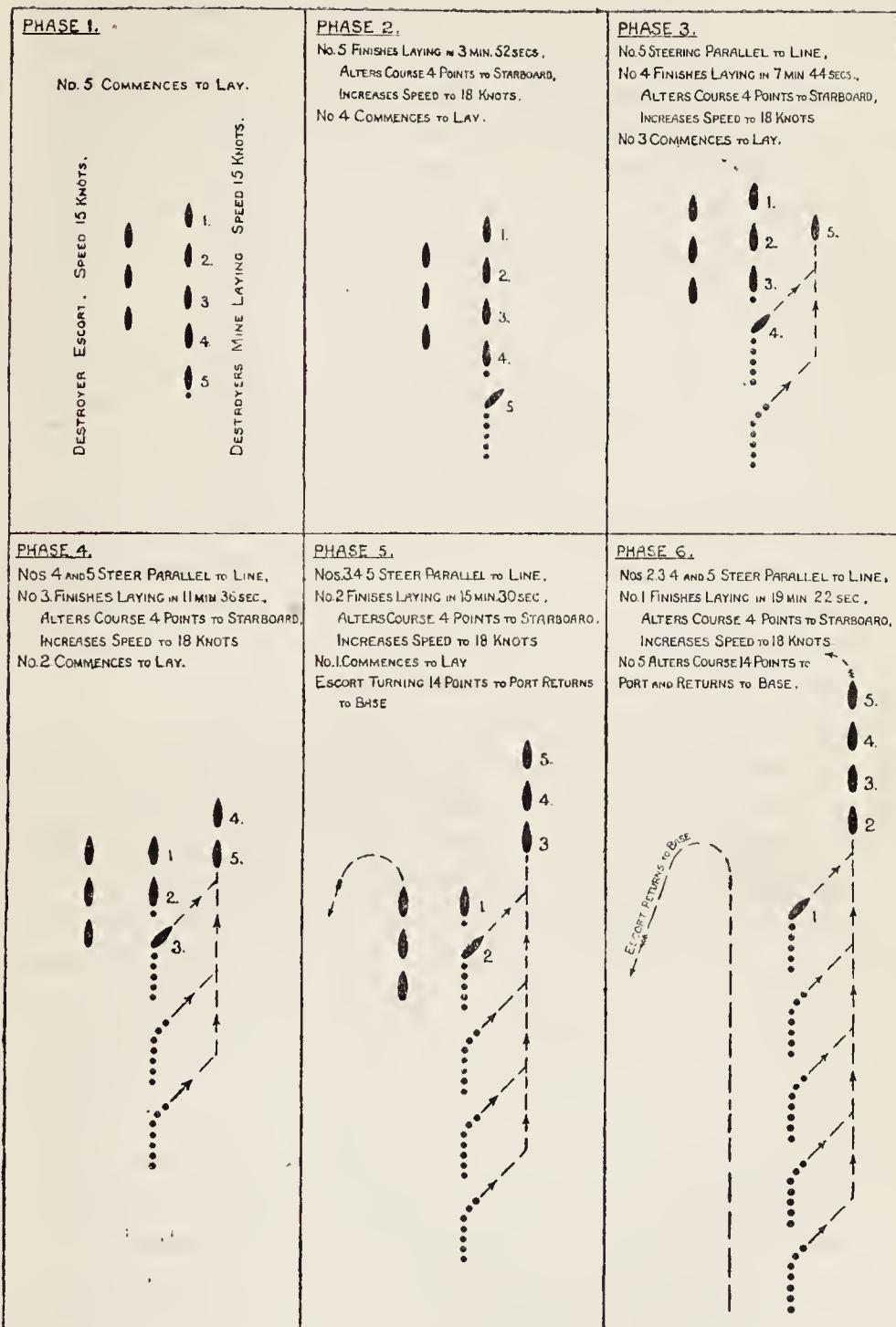
On the next attack, the *North Star* sank the electric motor-boat with gun-fire, and this was the last attempt made on the patrol with this class of vessel.

The *Erebus* had to go to Portsmouth for repairs, and this left only the *Terror* and *Soult* for the patrol line. While on patrol the monitors kept an accurate account of the tides, which information was subsequently issued by the Hydrographic Department. In addition, I sent Submarine C. 17 to lie on the bottom off No. 8 buoy, and find the rise and fall of the tide by systematic observations over twenty-four hours. The result was most interesting. First, because the rise of tide was six feet less than at Ostend, a most important piece of information, affecting both our mining and also our navigation on the Banks; and, secondly, traces of three high and three low waters were distinctly visible. Two high and two low waters are not uncommon, but three must be rare. These were caused by the action of (a) the North Sea tide, (b) the Channel tide, and (c) the Scheldt.

During 1917 other mine-fields between the latitudes $51^{\circ} 30'$ and $51^{\circ} 40'$, N. and longitudes $3^{\circ} 0'$ and $3^{\circ} 20'$ were laid by destroyers.¹ The procedure was for the patrol to lay a lighted mark-buoy, generally an "Aga" pattern acetylene buoy, at a spot accurately fixed close to the nets at a known bearing and distance from No. 8 buoy, the geographical position of which was known. The drifters lifted one mile of nets in the vicinity of the buoy. At a time arranged, according to the tide, the escort and mine-laying destroyers made this buoy, and then ran the line by dead reckoning from it. If the light of the buoy was out, or if it was too misty to see it, the attempt was abandoned.

When the long line had to be laid the problem was not a very easy one, as there were five destroyers crowded with mines, and one high explosive shell might have detonated a

¹ Cf. "z" on the Chart of the Patrol.



boat-load. The waters the mines were to be laid in were those used by the enemy. An escort was therefore necessary, not to protect the mine-laying destroyers, but to engage and lead the enemy off from them. The line ran nearly right up to the Dutch territorial waters and ended close to a shoal,¹ over which there was sufficient water for the destroyers; but at the same time, it was so shallow that steaming at a speed of twenty knots or over would have raised a sea and made collisions with boats in close order during a turn at night not improbable. High speed was, therefore, not advisable. Again, the escort had to form a separate column, so as to be free to proceed at high speed against the enemy. Turning sixteen points (180°) in two columns in shallow water at night, was again to be avoided, and finally all chance of the destroyers and their escort mistaking each other for enemies if they parted company and proceeded independently, had to be prevented.

The scheme I devised was that illustrated in the accompanying diagram. The escort formed on the port side of the mine-layers, and the whole force steamed at fifteen knots. As each mine-laying boat passed the lighted mark-buoy she noted the time, and from a table supplied to her knew the number of minutes and seconds which should elapse before she commenced her laying. Therefore she was on the alert. The rear boat commenced to lay at the proper time for the N.W. end of the line to be in the right place. As she was finishing laying, she signalled with a shaded lamp to the next ahead, who commenced to lay. The rear boat turned four points to starboard and increased to eighteen knots, turning again parallel to the other boats after running two cables. This increase of three knots was sufficient to allow her to pass the whole of the boats which were laying, and be in position shown in phase 6 at 5 when the leading boat finished laying at 1, and this was sufficient to allow all the boats to be in inverted order astern of her. At phase 5, when

¹ See the Chart of the Patrol.

three boats had finished laying they became escort, and the old escort turned fourteen points and went back at eighteen knots, so that there was no chance of the remainder overhauling them, and mistaking them for enemies. The diagram explains the intermediate steps. As a matter of fact, the boats did not lay all their mines on the straight course, but laid some while running on the four-point course to fill the gap which otherwise would have occurred, owing to the distance apart of the boats in column. The boats were practised first in daytime, and then at night off Dover, and the laying was most successful.

And what of the patrol? A typical summer day's work was somewhat as follows. The mine-sweepers and monitors on patrol assembled north of Hill's Pocket¹ at 2 a.m. The sweepers, supported by the monitors, then swept the passage towards the barrage. The destroyers joined the patrol off the Cliffe d'Island Bank. On approaching the barrage, the destroyers passed on ahead, hoping to surprise some German craft which might be working on the barrage at the break of dawn. Perhaps the destroyers would be seen to increase speed, and then gun-flashes would appear ahead as our destroyers, discovering the enemy, opened fire. The monitors would then increase to full speed and go to action stations, engaging the enemy in a running fight, and getting in a few shots at long range as the enemy made off towards the coast under the protection of the large-gun batteries ashore, which barred the further approach of our chasing destroyers.

Things having quieted down, the patrol would then proceed along the barrage lines. Enemy aircraft might appear out of the rising sun, and attack the squadron with bombs; but, not caring to fly low, would probably miss badly. Our own aircraft would then chase them off, but in turn come under the fire of the efficient anti-aircraft batteries on shore and be driven off from the hunt. Our destroyers might subsequently be reported to be flying the mine-flag, and be

¹ An anchorage between the shoals to the northward of Dunkirk Roads.

seen to be firing at short range into the water, sinking mine that had broken loose from their moorings and were floating on the surface of the water. With the sweepers still sweeping ahead, the patrol would then proceed along the barrage, the enemy's coast-line gradually becoming more distinct,¹ but with no further appearance of any German craft. The most eastern end of the barrage would be reached by midday, and then the sweepers' work would have been done for the day ; so they would be sent home to coal and prepare for the same thing on the morrow.

Suddenly, perhaps, would come the report of a gun ; a splash would be observed near the destroyers, who would be seen to be steering in various directions at high speed. The signal "submarine in sight" is recognised. One of the destroyers has spotted a periscope, fired at it as it disappears, and the hunt begins. All ships keep moving about at full speed, hoping that the enemy will give some sign of his position ; but nothing more is seen, and soon the patrol is resumed.

As the afternoon wears on a target is dropped and taken in tow by a motor-launch, and the monitor varies the monotony by some firing practice.

Aircraft again appear. Are they friend or foe ? They appear to be attacking, and are distinguished as enemies, so fire is opened on them ; this does not deter them from the attack, and their bombs fall but never a hit, for they fly too high in order to ensure their own safety.

Our own aeroplane fighters, bored with patrolling and waiting for the enemy who will not oblige, come down to the squadron and give a display of their abilities, skimming the calm waters like flying fish, banking round the masts and over our decks, making spirals, and loops, and then off goes the leader followed by the others of the flight, soaring up on a hunt for the quarry.

¹ On a clear day the windows of the houses in Ostend could be easily counted.

Meanwhile, the destroyers pass up and down the patrol line of thirty miles, and the mother of this family, the monitor, waddles up and down in the centre ready to support them. A couple of miles closer to the shore two other destroyers keep abreast of the monitor; they are the look-out and guard against the electric motor-boat.

The afternoon wears on, and then it is noticed that a spotting balloon is rising to the S.W. of Ostend. What this means is well known. The Tirpitz Battery is about to open fire on the patrol, which has come well within his range in supporting the drifters, now engaged in working on the nets of the barrage, for repair work is constantly undertaken in fine weather.

Work is at once stopped and the monitor orders the patrol to form up to get out of range, and tells the destroyers to make a smoke-screen. A large cloud of brown smoke is seen to appear suddenly from near the balloon. Round number one! Tirpitz has opened fire. Course is at once altered to try to avoid the fall of the shot by dodging. Fully ninety seconds have to elapse after the flash has been seen before that shot falls. What an age that time seems! At last a screech and a splash heralds its arrival. It falls one hundred yards on our bow, in the place where we would have been but for the change of course. The enemy are deadly shots; if we remain on a steady course the odds are on being hit. By now, however, the whole squadron is smothered with the smoke-screen, so that the enemy is foiled in his spotting. Nevertheless, he continues to fire salvo after salvo into that vicinity, and a warm time continues round the tortoise-like monitor.

The day draws to a close, and course is shaped for the roads of Dunkirk. The destroyers are sent on to fuel and rest before their work during the ensuing night. Slowly the monitor follows and eventually arrives in the roads at 10 p.m. and anchors. The mail comes on board and the orders for the morrow are read: perhaps they are to the effect that this

same monitor, the same sweepers, and the same T.B.D.'s will assemble at 2 a.m. for the patrol. So to bed for four hours' rest.

Such was the duty on the patrol line day after day, none knowing what would happen next. It was arduous, incessant work, but a happy relief from escort in the Channel, and provided good training for the officers, to whom the memory of their work on the Belgian Coast Patrol will remain long after the Great War has almost faded from the minds of those who were less actively engaged.

What was the real value of all this labour to the country?

The direct advantages, such as the reduction of German mining and the increase of our powers of close observation of the coast have been dealt with, but over and above these lay another, not so plainly apparent, but of greater importance, namely the protection of the Downs and Channel shipping. Our offensive strategy on the Belgian coast hid our weakness. The enemy never divined that all our real fighting force in destroyers, namely four of the Tribal class,¹ patrolled daily off his harbours. He never gauged that what to him would have appeared the sheer madness of our undertaking the offensive on his coast with so absurdly small a force, hid the fact that we had nothing except old obsolete destroyers to protect the Channel. Offence was our surest defence, and by an assumption of strength we hid our weakness and distracted his attention from undertaking serious operations against our life stream of commerce.

¹ Four destroyers only on the patrol had four-inch guns.

THE SONG OF THE BELGIAN COAST PATROL

See how slowly move our vessels as they pass along your shore,
Just as if the times were peace-times and we were not at war,
We're a challenge to your seamen to come boldly to the fray ;
We form a deadly insult as you watch us day by day,
With our broadsides to your harbours inside the Hinder shoal,
Here we flaunt the old White Ensign on the Belgian Coast Patrol.

You have had no sea traditions by your fathers handed down,
Nor history to emulate or make you seek renown ;
You can know naught of sea honour that the true-born sailor heeds,
Of the laws that rule his actions and regulate his deeds.
You know not naval chivalry, your "kultur" killed your soul,
Or you'd never brook the insult of the Belgian Coast Patrol.

Come right out and fight, you pirates ; you can see the force that's here.
There is nothing to support us, no reinforcement near.
You have merely to take courage and to try to rush our line ;
You will bring with you a challenge our ships will not decline.
Come and boldly stop the insult, come from the sheltering Mole
And those batteries that save you, come and fight the Coast Patrol.

You will not wage the honest war that of old the world has seen,
But try to win by murder with your pirate submarine.
You cannot grasp it's fighting fair that alone the fighter thrills,
Or that skulking out of gunshot all warlike spirit kills.
Send round more ships if you've too few, we'll gladly meet the whole
For the glory of Old England and the Belgian Coast Patrol.

CHAPTER VII

LANDING THE GUNS ON THE BELGIAN COAST

Landing four short 9·2-guns—Moving a 50-ton 12-inch gun—Mounting the gun for trial—Firing at the Tirpitz Battery—Assistance rendered by the French—Analysis of the firing—General conclusions—Interference by enemy smoke-screens—Offer of the experimental 18-inch guns—Method of their use ashore and afloat—The design of the mounting—Their employment in monitors—Transport to their shore emplacement—Adapting the Palace Hotel, Westende, to war purposes.

AMONG what I may describe as our lighter occupations at Dover was the landing of guns on the Belgian coast. The foreseeing and forestalling of difficulties in transporting and mounting heavy guns ashore proved a fascinating relaxation from the strenuous war conditions of the command. These guns, when once erected, proved of considerable value to our sea-work ; they were, in fact, essential to the landing operations which then were being planned. The work, therefore, was well worth all the thought, planning, and exertion involved, and it was successfully completed.

But, although it was relaxation to us, I fear that the description that follows in this chapter will weary all but the technical reader. The average person does not deal with ten-ton jacks or king-pins ; skidding has to him a different meaning. Moreover, danger spaces, muzzle velocities, and the Greek letter “ sigma,” dear to the theoretical gunner, have for him no fascinations. Let me, therefore, write a short untechnical account of what was done for the benefit of the untechnical, and then, if he gets weary during subsequent pages, he can skip the remainder of the chapter.

Briefly, then, as the long-range Tirpitz Battery which the

Germans had placed on the Belgian coast prevented the short-range monitors bombarding the dockyard at Ostend, we landed a 12-inch Mark X gun, of fifty tons, with its mounting weighing another fifty tons. No crane in Dunkirk was capable of lifting more than twenty-five tons. We, nevertheless, landed this gun and took it sixteen miles by road to St. Joseph's farm, where, having built a barn the exact replica of the other adjacent buildings, we mounted it and had a good shoot at Tirpitz. Everything had to be done by night, and all sign of work covered over by day, as we did not wish any kind of attention on the part of our friend Tirpitz during the mounting. This may all sound very easy, but it required weeks and weeks of thought and design. The reason for travelling by road was to avoid the use of a railway siding, which would inevitably have given away the gun position. In the mounting we were helped by Canadian railway engineers ; so we called this the Dominion Battery.

As an advance on the coast was arranged for the spring of 1917, I landed two more similar guns, and three 9·2 guns, weighing thirty tons each, and mounted them still farther from Dunkirk and near to the front lines. We also landed and mounted still nearer the lines eight 7·5-inch guns. Previously we had placed four shorter and older 9·2-guns well up at the front. Commander W. G. H. Bickford, R.N., was in charge of all the mounting work.

The Admiralty also offered me, I believe largely in chaff, and I accepted, three experimental 18-inch guns, weighing about 150 tons each, which I hoped to mount in the Palace Hotel at Westende as soon as our Great Landing had given that place into our hands ; but, in view of the contingency of our not being able to secure this piece of the coast, I arranged with the Admiralty to have alternative positions built on which to mount them in three of the 12-inch monitors so as to be able to bombard the docks at Bruges at a distance of twenty miles.

It is with the details of the above work that this chapter deals more or less technically.

In 1914 my predecessor, the gallant Admiral Hood, landed two 6-inch guns and one 9·2-inch on a railway mounting to assist in holding in check the Germans on their attempted advance along the coast. Commander Halahan, afterwards promoted to Captain and killed on board the *Vindictive* in the 1918 attack on Zeebrugge, was in command, and Lieutenant Shoppee was attached to assist him. These guns were manned by naval ratings and did incessant work in the forefront of all the counter-battery work. (See chapter XVI.)

The 9·2 guns of the *M.* class monitors were useless to these vessels for work on the coast; slow in loading, and short in range, their only possible value was when used at closer quarters than there was any chance of the ships being able to reach. The Admiralty was therefore approached to substitute 6-inch or 7·5-inch guns in lieu of them, and, to allow us to mount the 9·2-inch ashore near Nieuport as an addition to the naval guns already installed, as these would be useful for counter-battery work. Of course, it was realised that it would be necessary to mount them in concrete emplacements, as they were within short range of the enemy's 6-inch guns at Westende, to say nothing of our friend the Tirpitz Battery. Having had to do with the design of the equipment of the 15-inch howitzers, I knew the loads the various trucks would carry, and the tractive power of the Daimler-Foster 105 H.P. tractors. Four of the trucks used with the howitzers and two tractors were obtained, and the necessary alterations to the former carried out in Dover dockyard. The principles involved were simple, namely, to avoid, as far as possible, any lifting of the dead weight of the gun and mounting—to slide and lower, but not to lift—and to arrange so that the guns, which were of great length, could be turned round the sharpest corners in the streets of the villages.

Plate XXI shows the gun mounted on two such trucks, resting on chocks capable of revolving on top of the trucks. Baulks of timber took the push, and the ordinary draw-bars

the pull, during transport. If the wheels of such a truck are run on to wooden planks placed on the ground, the wheels can be skidded and the truck turned at right angles to its normal position, and the gun pivoted round in the way that was done with the 12-inch and shown in Plate XXII. By this means, a gun can be turned completely round in its own length. This circular traverse was used for mounting the 9·2 guns in positions when room admitted, as shown in Plate XXI, where a "Stone-Henge" of pillars made of 1 foot by 1 foot baulks, with similar-sized baulks on top, surmounted by a circular rail to lessen friction, supplied a circular way for the gun-muzzle to traverse on. This method of mounting was simple. The gun was run across the rear end of the mounting with the rear truck immediately opposite the cradle. The pillars, baulks, and rails were put into position and the gun-muzzle traversed round till its axis was dead over the centre line of the cradle. The two posts were then erected one on each side of the muzzle with a strongback across the top. The lifting wire was rove, and the end taken to a tackle, the fall of which went to the winding-gear of the tractor. As soon as the weight of the muzzle was taken, the baulk and section of rail immediately underneath was removed. The weight of the breach was taken with jacks, the chock removed, and the whole gun lowered by the jack and tackle into its cradle.

It will be seen that a girder platform was used to which the mounting was bolted. This was placed at an angle of 10 degrees to the horizontal to give extra elevation.

Four of these gun-mountings were sent over and erected for counter-battery work. Their emplacements were built by Major (now Brigadier-General) Hervey of the Canadian Engineers, his assistant, Captain Wilson, and his invaluable corps.

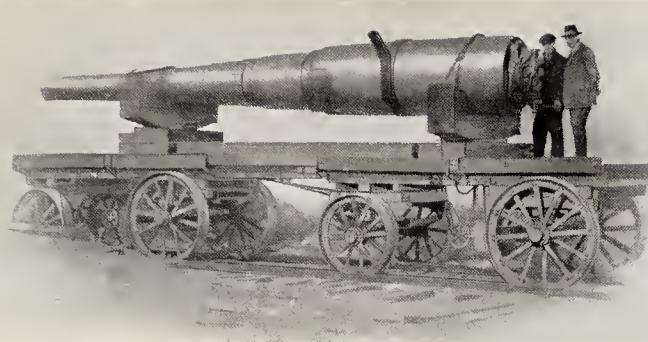
General Hervey did much work for us, and always looked on the bright side of things. He is credited with having built a railway in conjunction with the Belgians when he knew

no French technical terms, his Belgian colleague knew no English ones, and the interpreter knew no technical terms either English or French !

The bombardment of Ostend on September 7th, 1915, showed that it was useless to think of attacking this place with monitors with their short 12-inch guns, so long as the Tirpitz Battery remained intact. The problem was, how to get at this battery. I remembered that the Coventry Ordnance Works had two steel plate and angle girders which had been used for the trial of their first 13·5-inch gun-slide. This, I thought, might be converted for use with a 12-inch Mark X gun and a range of 30,000 yards obtained with 45° elevation.

Fortunately, I had intimate experience of this nature of design. Admiralty approval was therefore obtained for a 12-inch gun and slide to be allocated to us, and, having got into communication with Mr. Redpath, the talented chief Designing Engineer of the Coventry Ordnance Works, the problem was immediately tackled. I had no fear of not being able to handle the gun, land, transport and mount it after our experience with 9·2-inch guns, although gun and mounting each weighed fifty tons. It was only a question of sufficient thought being devoted to the solution of the problem, and to devising the necessary mechanical means, so that the design of the mounting was entered on with a light heart.

The chief difficulty lay in elevating and holding the gun steady during firing, traversing the gun for direction, and providing a foundation to take the recoil. This last problem was not difficult, as I had behind me the design of the 15-inch howitzers and their platforms, which we had made at Coventry, and which I had commanded in France early in 1915. The recoil energy of the 12-inch gun was not very different from that of the 15-inch howitzer, so it merely meant an adaptation on the same principle. It was only necessary to traverse the gun through a small angle, so that a slow rate was permissible; but the elevating was a difficulty. The only power that



9.2-INCH GUN AND MOUNTING.

(1) View showing method of transport. (2) Gun being assembled on to mounting.
(3) Gun assembled on to mounting.

MODEL SHOWING METHOD OF TRANSPORTING HEAVY NAVAL GUN, AND ASSEMBLY INTO MOUNTING.



One method by which the gun-truck could be used to mount a gun. The front half of the truck being used to swing the gun round over the mounting.



Gun-truck bringing up the gun to the rear of the mounting.

could be considered was such as could be obtained from an oil-pump worked by a petrol motor; moreover, it was highly desirable to use the existing elevating cylinder in order to save long delays in designing and making new parts of this description, especially in view of the abnormal war work which completely filled the armament shops in England.

The existing elevating cylinders only permitted from 18° elevation to 5° depression, and 45° elevation was required. The solution lay in tilting the elevating cylinder so as to work between 45° and 22° of elevation, which comprised all the firing angles. This occupied all the travel of the elevating ram. The gun was swung by hand power through the 22° to horizontal for loading purposes. It will be seen that, for the angles at which firing would take place, that is, from 22° to 45° , the gun was firmly held by the elevating cylinder, which was an important point, as steadiness on firing was essential. The details were soon worked out, and hand elevating by means of wire ropes attached to the rear end of the slide working over pulleys on a vertical structure proved a satisfactory method of elevating and depressing to and from the loading angle. As no accumulator could be erected, stop-cocks were fitted in the pipes supplying oil to the double-ended elevating cylinder, enabling an absolute lock to be obtained to hold the gun at any desired angle.

The platform was constructed from two 15-inch howitzer platforms placed end to end. These were a unique piece of design, as every portion was portable. They consisted of square plates checked in to each other to form a floor 20 by 20 feet, with angles riveted to the underside to act as spades to check any tendency to move under recoil. Above were bolted rows of H-beams running transversely across the whole of the plates, and above these were bolted longitudinal H-beams of rather heavier section. To these in turn were bolted the central pivot plate, and the rear traversing plate. A portion of this structure is visible in Plate XXIII.

The traversing was arranged for by a large turnbuckle

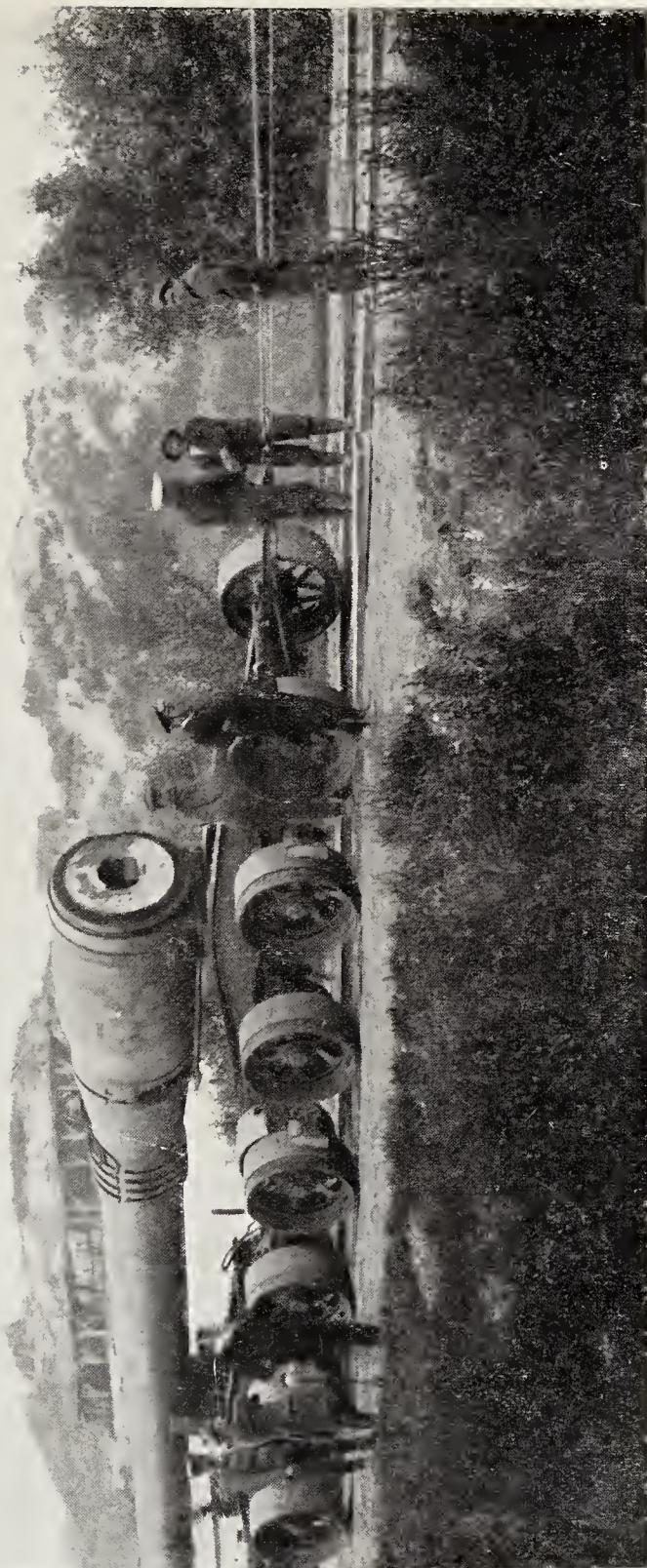
hooked either to the right or left side of the platform and to the mounting, with hooks and chains to heave the rear end over to one side or the other as required. Every form of complicated mechanism for training or elevating was avoided. Loading was arranged by a hinged loading-tray and a hand-rammer, the projectile being lifted by a quick-working hand-crane. Eventually it was found quite easy to ram home and seat the projectile at 12° of elevation, so that the return to the horizontal was unnecessary. The magazine and shell-room were of the simplest description, the cordite charges being stowed in wooden cases in the open, and the shell one calibre apart along a side-road on planks with a gentle incline down to bring them to the gun. This may be thought primitive, but it was efficient. Later on it was found advisable to store the charges in a shelter to keep off the direct rays of the sun, and, thereby, maintain an even temperature of the cordite.

While the mounting was being designed, the method of transport was also taken in hand. One essential that I insisted upon was that the gun was to be transported by road and not by rail, so that its location would not be known by the enemy. A gun that moves by night by road can be easily hidden, but a new railway siding always attracts attention. The gun weighed 50 tons, so that 16 wheels gave a weight of just over 3 tons per wheel due to the gun. To this had to be added the weight of the truck itself—about 35 tons. This gave a load of 5 to $5\frac{1}{2}$ tons per wheel, which was permissible with an 18-inch tread and a wheel of about 3 feet 6 inches diameter. Here I called in Sir Wm. Tritton, of Foster's, of Lincoln, who had worked with me on the 15-inch howitzer equipment.

A general idea of this truck can be gathered from Plates XXIII and XXIV—four bogies, each of four wheels linked by strong-backs to form two pairs each of two bogies, with a support on one strong-back for the breech end of the gun, and, on the other, a chock to take the gun at about the end of the B-tube. The two pairs were coupled together for

GUN-TRUCK WITH 12-INCH 50-TON GUN.

PLATE XXIII.
1881



GUN-TRUCK WITH 12-INCH 50-TON GUN BEING TRANSPORTED BY THREE TRACTORS EACH OF 105 HORSE-POWER.

PLATE XXIV.
1891



transport by ordinary draw-bars. Steering-gear was provided for each bogie for backing, good brakes being of course a necessity. The wheels had 12-inch treads with 6-inch extension pieces to add surface for working on soil.

The question of turning sharp corners had to be considered, as frequently roads in Belgian villages are anything but straight. The principle adopted with the 9·2-inch guns was extended, and the gun-truck fitted so that each pair of bogies could be turned through 90° independently of the other.

To do this the king-pins,¹ which had the supports for the gun on top, were taken through their strong-back and fitted with a broad collar underneath. Between the top of this collar and the strong-back was a ball-bearing. A large hydraulic jack on a travelling barrow was provided. This jack is clearly seen in Plate XXX, showing it lashed on top of the rear end of the gun-truck while the latter was being used to transport the mounting. To turn a pair of bogies, the jack was run under the king-pin and pumped up. This lifted the pair of bogies off the ground, bringing at the same time the ball-bearing hard between the collar and the strong-back. The pair of bogies could then be traversed round on the ball-bearing, the wheels being well clear of the ground. Plate XXII, a photograph of a model of the gun being mounted, shows the bogies slued in this manner. A second carriage was provided to transport the gun-slide and cradle (Plate XXVIII).

The side-girders were transported on one half of the gun-truck (Plate XXVII). Subsequently, however, for the later guns, the whole gun-truck was adapted to carry the side-girders, cradle and slide assembled in one piece—Plate XXIX. The weight of the load was again just fifty tons.

One problem which arose regarding the transport of the gun to France was due to the absence of any large cranes—thirty tons was the largest—at Dunkirk, and it appeared as

¹ A king-pin is a pivot-pin which allows of a turning movement between the axle and the carriage.

if the gun would have to go to Cherbourg to be lifted out. This meant transport by rail in France, which, in turn, would have necessitated sending a railway truck from England. Only one or two of such trucks existed, and one could have been spared with difficulty. Another method of solving the problem had to be devised.

Dealing with heavy weights had always been a hobby of mine, so that the solution was soon reached. Why not roll the gun ashore from the upper deck of the transport at high water? The monitors were ideal for this purpose. So the *General Craufurd* was sent to Chatham and two sloping brows were built; one end was designed to be lashed to her superstructure and the other to rest on the quay at Dunkirk, so as to enable the gun to roll down: Plates XV and XVI illustrate this method. The gun itself rested on large beams on the deck of the superstructure, and the edges of the brows were coterminous with the top of the beams, so that there was no drop or ridge. Bolts were fitted for leading blocks for the easing-out wires, and tackles fitted to the ends of these. Hauling-out wires were fitted to go to a tractor ashore. The whole operation was simple, but attention to certain details was necessary.

First, the most convenient jetty at Dunkirk was that to the west of the seaplane base. By using this, the gun had no lock caissons to pass over, these being hardly up to the weight of the gun and truck. But the depth of water at low water was insufficient to float a monitor, so everything had to be done between half-tide and half-tide. To save lifting the gun with jacks when ashore, baulks of timber were built up, on to which the gun could be rolled. The two halves of the truck could then be run under the gun in the right positions for their chocks to take the gun in transport. The gun was then jacked down on to the truck, and the timber removed. The two halves of the truck now at right angles to the axis of the gun could be hauled by two tractors to the centre of the quay, then the king-pins jacked up as described, and the



TWO 12-INCH 50-TON GUNS BEING LANDED AT DUNKIRK FROM THE "GENERAL CRAUFURD."
One gun has been rolled ashore, the second is just starting to roll down the platform. Note the wood built round the gun to bring the rolling surface to an even diameter.



A 12-INCH 50-TON GUN BEING ROLLED ASHORE FROM THE "GENERAL CRAUFURD."

On the first occasion the gun was not covered with wood and brought to an even diameter, which made the operation of rolling difficult to carry out.

two halves rotated through 90° and coupled up, now in line with the axis of the gun, and ready to move off.

In rolling the gun down the ways, as the diameters of the gun at the muzzle and breech ends were not the same, the muzzle end had to be skidded as well as rolled. This was a nuisance, as the chase¹ bit into the wood of the brow and was difficult to move. This made the whole operation slower than it should have been. The later guns were, therefore, wolded with wood as shown in Plate XXV to make them of constant diameter over their rolling area, and the operation was thereby considerably expedited. Commander Altham, in the *General Craufurd*, brought over the three 12-inch and three long 9·2-inch Mark X guns and landed them all in this manner.

The task of transporting and mounting the guns was put under Commander Bickford, D.S.O. He first came under my notice in the landing of the 15-inch howitzer at Boulogne. I applied for his transfer to my staff and he was appointed. The harder the work and the wetter the weather, the more thoroughly he enjoyed himself; nor did he mind the poison gas or high explosive shells strewed round him by the enemy.

During the period when we were dealing with the problems of mounting and transport, the site for the gun position was chosen by General Rouquerol. A large sand-dune near Oost Dunkirk was selected and a tunnel 100 metres long driven into the centre and the centre excavated. I must confess I was a little uneasy about the gun being mounted so near the front line, as many guns could be brought to bear on it; but all went well till the platform was laid. Then suddenly the Germans one day gave the position a really good strafe and broke up the platform. This was the death-knell of a forward position. The next place chosen was at Adenkerke, about 27,000 yards from the Tirpitz Battery, against which it was intended to operate, and in turn this was the only German battery that could range it. This position was about twelve miles from Dunkirk.

¹ The chase is the muzzle end of a heavy gun.

In order to keep the erection of the gun from view of the enemy's aeroplanes, the site chosen was close to St. Joseph's Farm, which had the usual outbuildings. One additional barn was built resembling those used in the locality, in which to house the gun. In order to admit of 45° elevation, the front part of the roof was cut away and covered with a removable canvas cover. This barn is shown in Plate XXXII.

The original intention was to sink the mounting into a pit in the ground, but it was found that the ground was completely waterlogged at three feet from the surface, so this idea had to be abandoned. It should be appreciated that the platform, therefore, was laid practically on a bog, and it speaks well for its design that it remained stable throughout the firings. The preliminary rounds showed a movement to the rear, so the back part was supported by wooden uprights, three feet long, driven into the ground, with boards also driven in front to form sheet-piling. This stopped all further movement.

In order to mount the gun out of reach of the enemy's gunfire for the first attempt at mounting—which was sure to be a slow operation—a site at Braye Dunes was chosen and here the first mounting practice took place. This also supplied the local gossip with inaccurate information as to its eventual location.¹

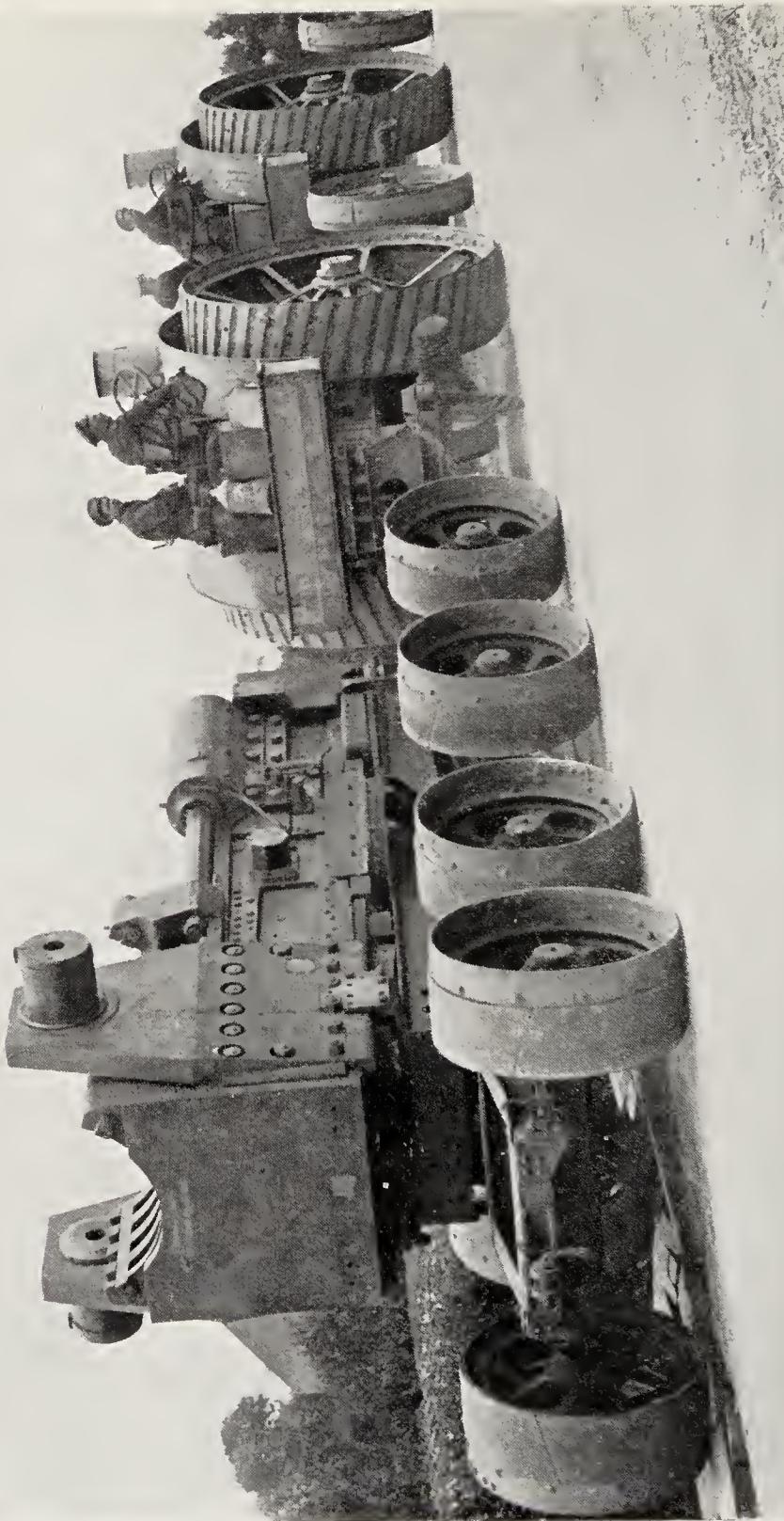
After erection, the gun was dismounted and transferred to its new quarters and was ready to fire on the eighth day after the move began. In this work, Major Hervey and his Canadian Engineers again afforded valuable assistance. The gun's crew lived in the farm, which had been evacuated by its tenants. In order to keep the position as secret as possible, the approach was guarded by a sentry, and there was a large notice-board designating it as the rest-camp for the Kite-balloon Section.

So as to provide accommodation for plotting the rounds to correct the gun-fire, a room in a farm, about a quarter of a mile

¹ See Plate XXXI.



PLATE XXVII. A 12-INCH GUN MOUNTING BEING TRANSPORTED BY ROAD TO ITS POSITION AT THE FRONT.



THE 12-INCH CRADLE WHICH FITS INSIDE THE MOUNTING SHOWN IN THE PREVIOUS PLATE BEING TRANSPORTED ALONG THR ROAD.

away, was rented, a wireless station erected and telephone communication established with the gun, and also with the forward observing station on the Nieuport front. Three independent sets of observations were thus made available : Wireless from aeroplanes (the best) ; observations from the forward stations ; observations from kite-balloons. A smoke-screen to hide the bursts of the enemy's shell was arranged for.

The earliest opportunity was taken to fire at the Tirpitz Battery ; but the weather was against us. I had no intention of firing except when the weather was perfectly suitable, since it was folly to give away the position of the gun when conditions were not in our favour.

On July 1st, 1916, a trial round of shrapnel was fired to test the mounting, as a single round would not attract attention. Everything was correct with the gun, but the shrapnel broke up in the air and a piece landed near the front lines. Fortunately no one was hit. General Rouquerol had obtained two 9·2-inch French guns on railway mountings and placed them in protected positions near Coxyde to fire at the same time as our 12-inch gun.

Every day now was watched for a chance of firing, but it was not till the 8th that the weather permitted observation of fire. Then the French 9·2-inch guns also opened fire. We fired twenty-one rounds from our 12-inch. Tirpitz replied, but only to strafe the old emplacement in the Dunes, which we had abandoned. On the 9th we again fired, in conjunction with the French, from 11.30 a.m. to 7.40 p.m. Tirpitz replied by firing 104 rounds at the French guns. The French High Command then withdrew their guns. Now the officer in command of the Tirpitz Battery was a very wideawake individual, and I knew that within a few rounds of our firing by ourselves our position would be spotted, and Tirpitz would return our fire ; at the same time the Germans might start a smoke-screen ; so, to deceive them, the *Lord Clive* was fitted with a canvas funnel so that she should look like a new 2-funnel monitor and fired blank in the offing, with exact

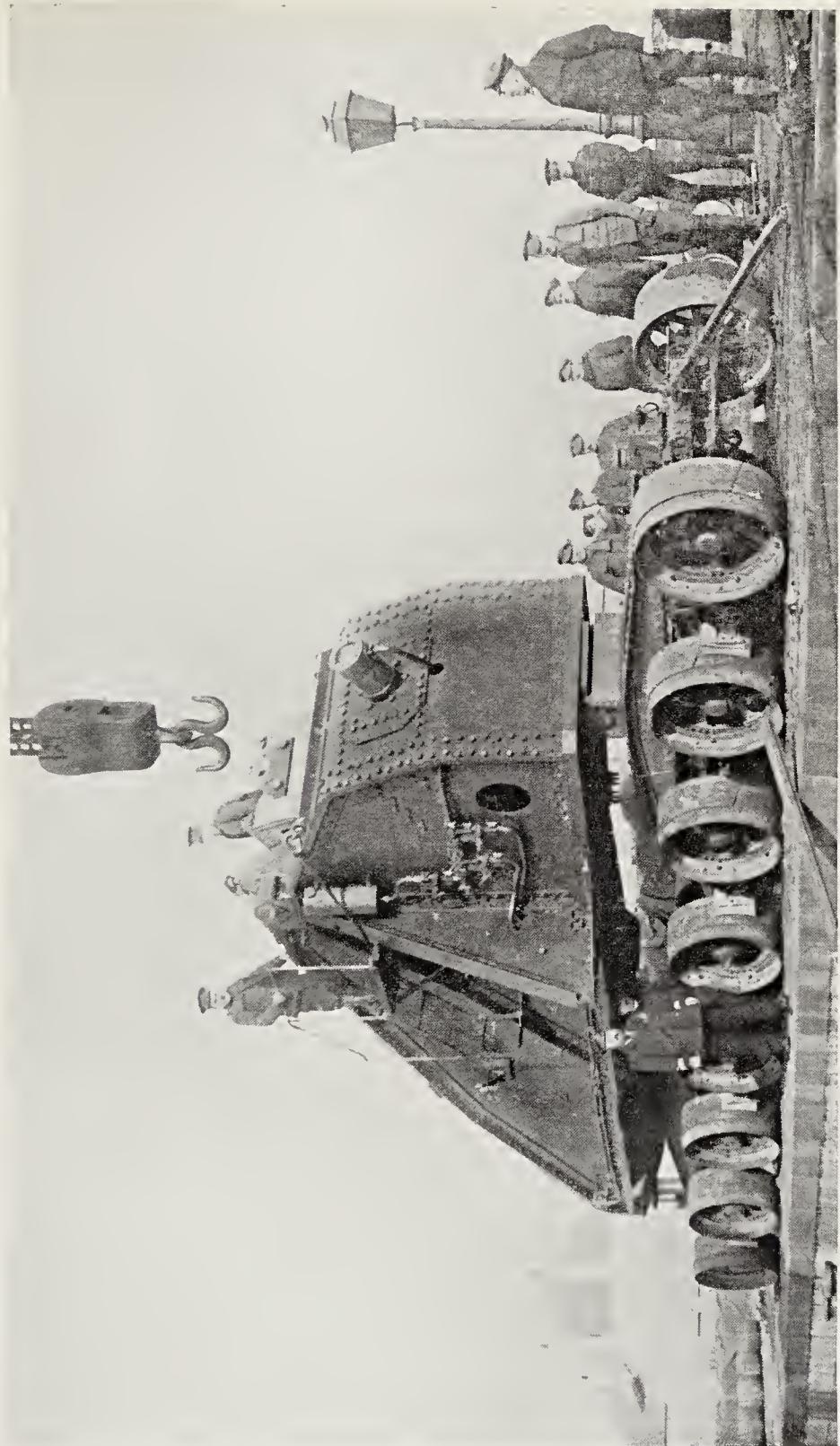
timing by wireless telegraphy signals, round for round, with the opening shots of our gun.

The weather was now against us again, and it was not till the 20th that firing could be resumed. Then we had to leave off early as the wind was strongly against us. Tirpitz this time ranged us, but our smoke-screen was started and he did no damage. On the 21st we fired again, and on August 3rd we also fired, but had to leave off as spotting conditions were impossible, Tirpitz having put up a smoke-screen.

The gun was now becoming badly worn, and required re-lining. After reviewing and analysing all the firings, I was able to arrive at definite conclusions as to future proceedings. Plate XXXV shows the results of the firing up to the end of the second day's shoot. It will be seen that all four concrete emplacements of the Tirpitz Battery had been hit—two guns being probably put temporarily out of action—but none of the *mountings* had direct hits. This meant that the 12-inch gun could damage the battery for a limited time, but that very few days would be required to repair the damage. The best line of procedure, therefore, was to mount more guns and keep them in reserve for an advance along the coast, so that at a critical moment they could be used to damage Tirpitz when time would not permit repairs to be effected to make the battery again efficient before our troops were upon it.

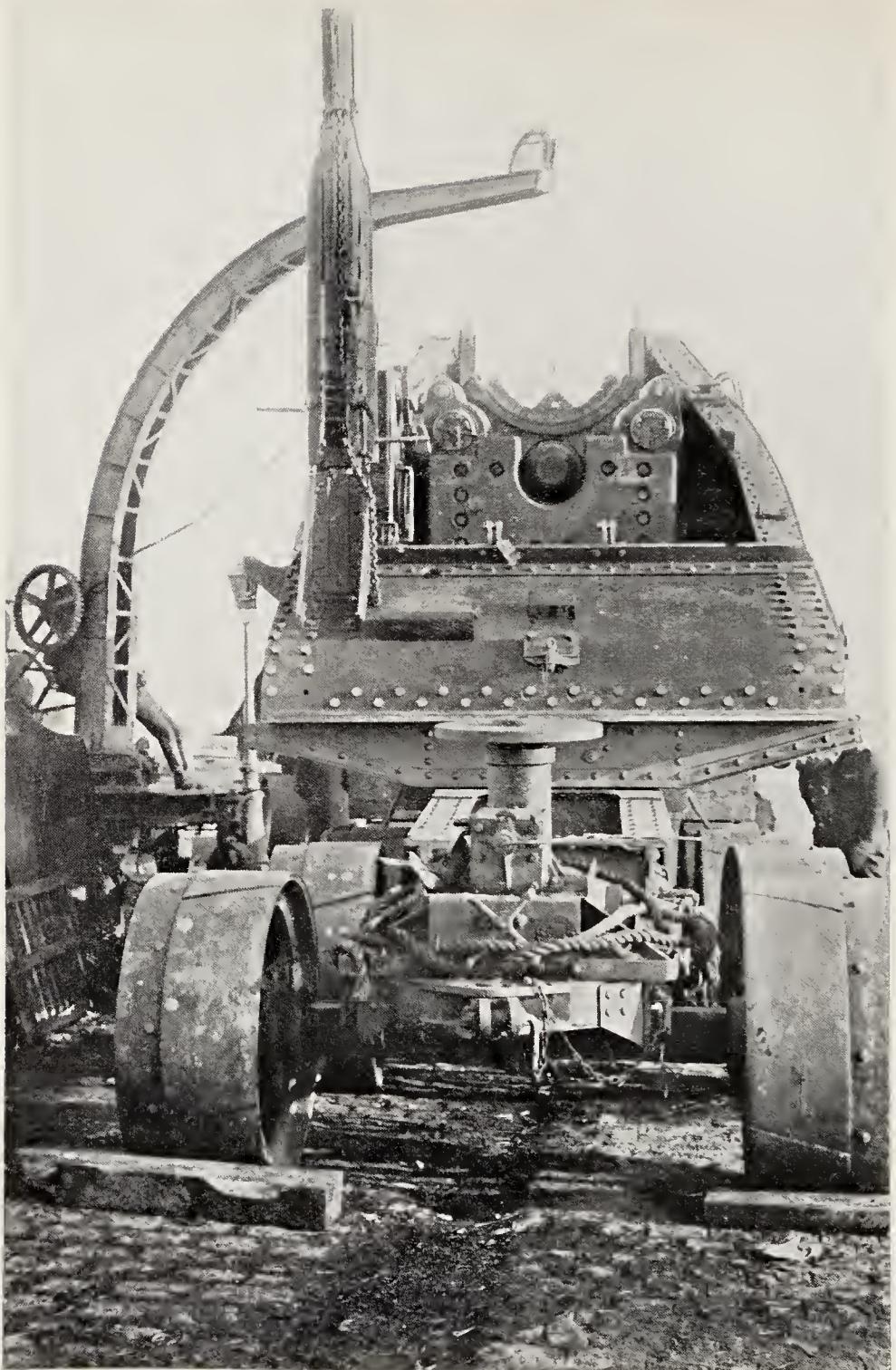
The analysis of the firing was most interesting. It was very carefully made and forwarded to the Admiralty, but it is too technical to be of general interest. It showed, however, that a smaller 50 per cent. zone was obtained than that which had been previously estimated. Moreover, the wear of the gun was greater. One particularly valuable point was brought out, namely, that in prolonged firings, wear of gun should be allowed for at every three rounds.

On July 8th, 1916, the target was found on the seventh round fired, or the third round spotted. On the 9th, the target was found at the third round, and thirty-nine rounds were fired.



THE GUN-TRUCK WAS SUBSEQUENTLY ADAPTED TO TRANSPORT THE MOUNTING WITH ITS CRADLE IN POSITION—A LOAD OF 50 TONS.

PLATE XXIX.
[194]



REAR-END VIEW OF A 12-INCH GUN MOUNTING AND ITS CRADLE IN PLACE ON
THE GUN-TRUCK.

Note the portable hydraulic jack being carried in the rear of the truck. This was used to jack up and slew the bogies for turning sharp corners.
PLATE XXX.

On the 20th eleven rounds were fired, but a variable wind made regular shooting impossible. On the 21st seven rounds only were fired on account of the German smoke-screen; two of these were marked as hits on the emplacements.

At the time of my service as Director of Naval Ordnance long-range shooting had been one of my absorbing interests. The analysis of the firing was, therefore, a labour of pleasure. One interesting point brought to light was that the difference between the last round on July 9th and the first round on July 20th was $2^{\circ} 15'$ in elevation. The barometer and thermometer on the 9th were 29.4" and 56° respectively, and on the 20th, 30.15" and 68° . Hence the difference in range due to barometer and thermometer measured at the earth's surface was twenty yards *decrease* in range. The surface temperature rose 12° between the two dates, which, if the cordite followed the atmospheric rise, would give 468 yards or $56'$ *increase* in range on the 20th. This increase must be added to the difference in elevation on firing to get the actual difference in elevation that would have resulted had the barometer and thermometer been the same on both days. The difference in elevation, therefore, becomes $3^{\circ} 11'$. This corresponds to a wind correction of 126 m.p.h., or of two winds of 63 m.p.h. in opposite directions on the two days. Again, the elevation increased during firing on the 20th by at least 2° , or 81 m.p.h. above the wear of the gun. This added to 63 makes 144 m.p.h. as the final wind. This is absurd.

A fall of 10° in temperature in one day for a barometer of 30.15" would be equivalent to a loss of 376 yards in range. The alteration in cordite during a single day's firing must be *nil*. It was therefore not apparent why this large difference on the 20th arose, since it would be necessary for the temperature to drop 27° between 1 p.m. and 4 p.m. to account for this difference. It seemed, therefore, that neither wind nor temperature correction as calculated by the formulæ then in use could account for the large fall in range between the two

days' firings, or the fall during the firing on the 20th. The gun was laid by clinometer.

The Director of the Meteorological Office supplied the following information: On July 9th there was a step of 10 micro bars between a "high" over the Alps and a "low" over Shetland, and on the evening of the 20th there was a difference of exactly the same amount in exactly the opposite direction. That accounts for a change of wind at 1,500 feet from S.W. 15 miles per hour to N.E. 18 miles per hour, and this might easily become a difference of 60 miles per hour higher up.

As a matter of fact, subsequent theoretical investigations in England led to a considerable increase of amount of the ballistic coefficients over that published in the range-tables, which was an interesting confirmation of the results we had obtained. It should be appreciated that this was the first occasion that systematic firing and observation had been carried out with British guns at anything like a range of 30,000 yards, either in war or in peace time.

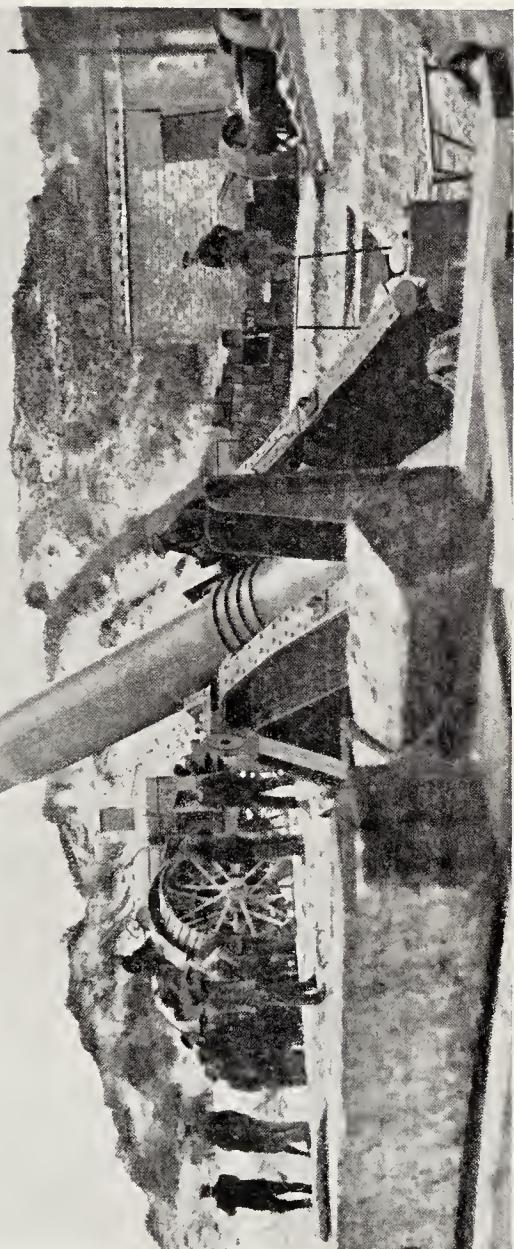
Occasionally in spotting, errors occur possibly both in observation and also in transmission; and variation in wind, such as squalls, may introduce temporary variations in the accuracy of fire. It, therefore, seemed reasonable that "meaning" the last three spots should tend to smooth out such errors.

A completely new firing was calculated from the absolute position of each observed burst; each round had given to it the same error as the corresponding old round, but the corrections applied, were those based on the mean of the previous three rounds. The results were practically the same as those that would have been obtained had the method been used of applying the mean of three rounds to the gun during actual firing.

The net result was, that the error in the firing worked out almost identically in amount in both systems, and therefore but little of value resulted. This was chiefly owing to the fact

PLATE XXXI.
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A 12-INCH 50-TON GUN MOUNTED IN THE SAND-DUNES AT BRAVE DUNE.



VIEW OF THE 12-INCH GUN-HOUSE AT ST. JOSEPH'S FARM AT ADENKERKE.

PLATE XXXII.
[197]



that a "bad" round, though affecting the succeeding round less when "meant" with the previous ones, exercised a bad influence on the following two rounds; but when the shots were well on the target the "meaning" system gave an appreciably better result. Perhaps, had more discrimination been exercised in discarding doubtful spots, the "meaning" system would have shown better results all through.

The chief difficulty in slow firing is to judge between changes in weather, and inaccuracy of repetition in the succeeding rounds. It is quite possible always to be behind in allowing for the effect of a rising wind, and what looks like a bad shot may be due to such a cause. Discrimination is easier in analysis after firing than at the time of the actual operations.

For two and a half months cloudy weather stopped all firing, and when we recommenced the Germans had so improved their screen by throwing up black and white smoke that spotting was impossible. Means for defeating this had to be devised, and one method that appeared reasonable was to aim with one gun at some point at a known difference in azimuth from the target, where a smoke-screen would not have been prepared, and after ranging to switch the guns on to the target, repeating the operation at intervals during the firing to correct for any atmospheric changes. There was a variation of this, which gave greater accuracy, namely, to mount a gun of similar calibre and ballistics about six miles in rear of the other guns, and to fire this at exactly the same geometric range and bearing as the target was from the forward guns, at some well-defined spot where the enemy had no smoke-screen, keeping up a fire round for round with the forward guns.

Constant corrections were by these means obtainable and under the same relative direction of the wind and the path of the projectile for both guns, since it was improbable that difference in wind-strength would exist in the upper air for a difference in geographical position of only six miles. It meant, however, wasting somewhat the fire of one gun. But,

as accuracy of fire was essential, I adopted this method. The Admiralty had in the meantime approved the manufacture of two more sets of 12-inch mountings, one of which was erected near the S. Joseph position, but sufficiently displaced from it to ensure that a bad shot intended for one position would not hit the other. The third gun was mounted six miles in rear.

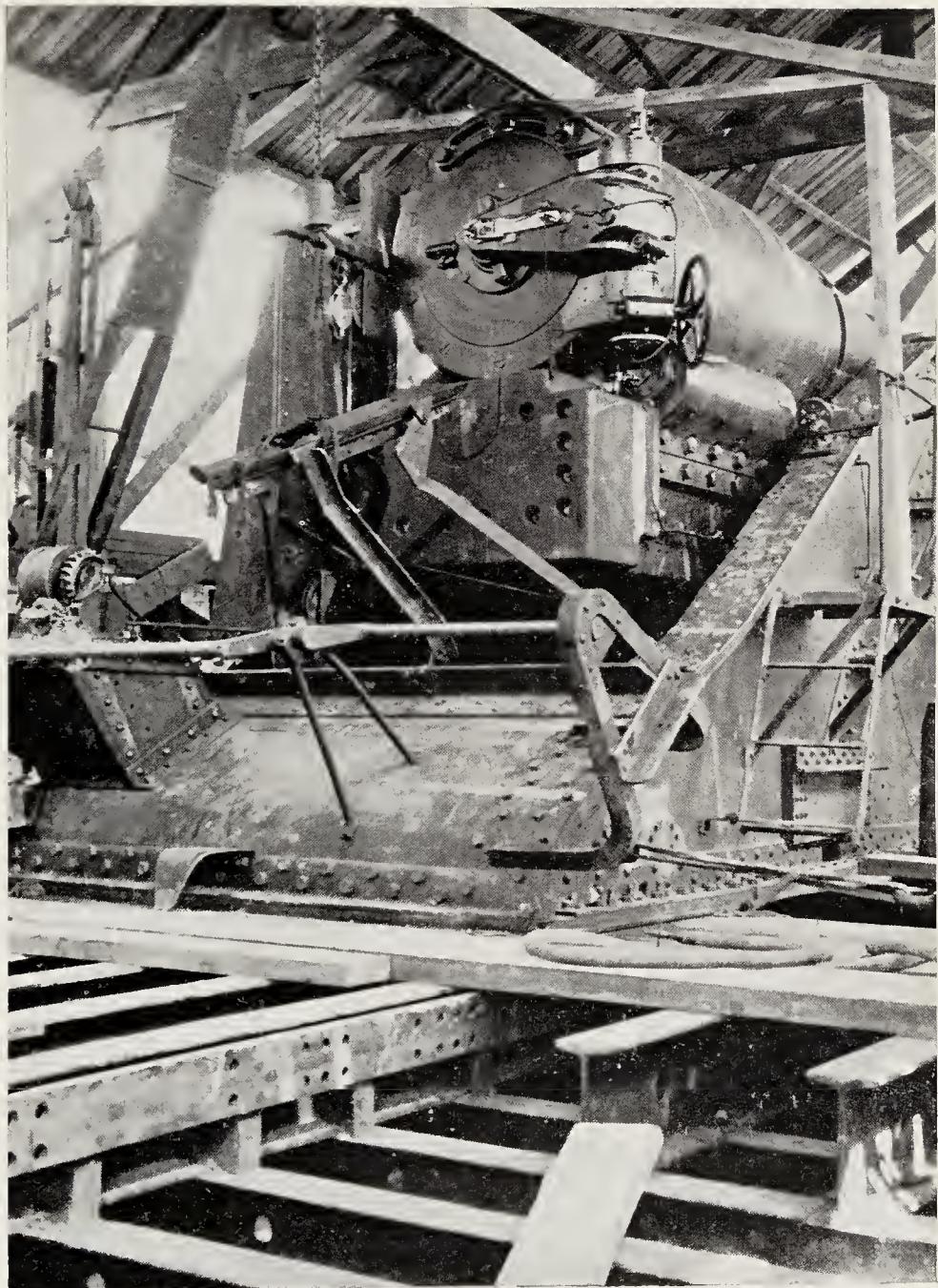
When the advance along the coast became imminent—that is to say, in the latter part of 1916—we obtained from the Admiralty three 9·2 Mark X guns, and permission to design mountings for them. These were designed in conjunction with Messrs. Vickers, and practically reproduced the features of the 12-inch mounting; except that, as the gun was designed for hand-elevation, no power was required. Plate XXXVI shows one on a truck for transport.

The diagram opposite shows a section of one of the two magnificent emplacements not far from Coxyde built by the Canadians under Major Hervey. The guns were mounted without difficulty, using the same trucks and sections of the gun-truck designed for the 12-inch. The third gun was mounted behind for ranging purposes. Not only could these range on Tirpitz, but also on the sixteen 6-inch guns mounted by the enemy at Raversyde. No firing was conducted with these, in order to keep them as a surprise for the great day.

Of course both the 12-inch and 9·2-inch back guns were so placed as to enable them to do valuable execution among the numerous batteries close behind the enemy's line at Nieuport.

We then rested from our shore mounting labours, having got into position and in the places desired, under effective protection, four short 9·2-inch guns, three long-range 9·2-inch guns, and three 12-inch long-range 50-ton guns—all ready to supplement the six 15-inch guns of the monitors on the great day when we should take the coast in collaboration with the Army.

In addition to the above, eight 7·5-inch guns were landed



BREECH VIEW OF 12-INCH MARK X GUN MOUNTED IN THE GUN-HOUSE AT
ST. JOSEPH'S FARM.

Note the girder platform on which it is resting.

PLATE XXXIII.

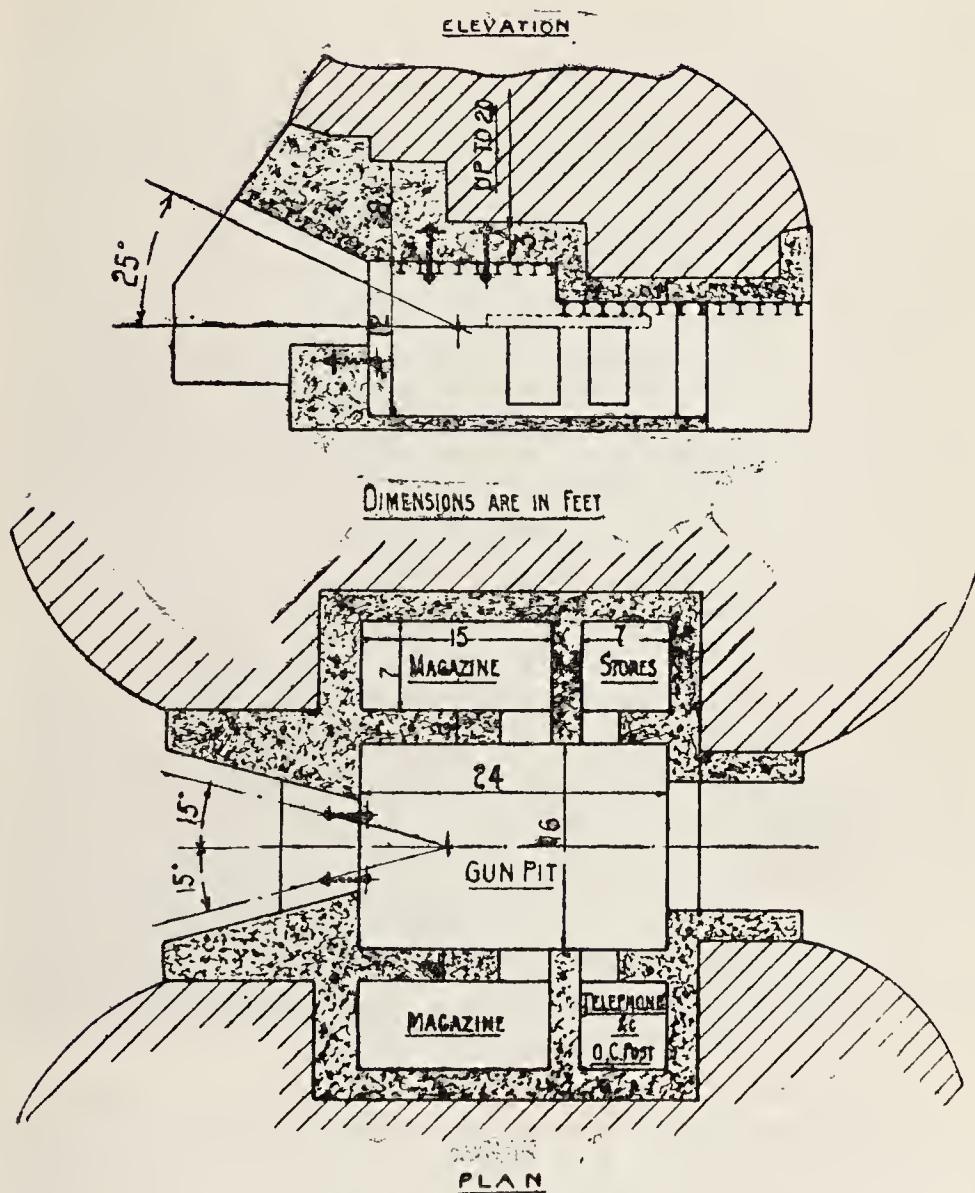


THE 12-INCH MARK X GUN LANDED AT DUNKIRK, AND MOUNTED AT
ADENKERKE, FIRING AT THE TIRPITZ BATTERY.

PLATE XXXIV.

LANDING GUNS ON THE BELGIAN COAST 199

and mounted for counter-battery work, when preparing for the advance on the coast.



The guns were kept under my immediate command, as I had no intention of having them worn out before the day of their real use; but, when the British Army took over the coast

sector, I at once turned them and their crews over to the Commander of 10th Army Corps.

In the summer of 1917 the Admiralty offered me two (afterwards increased to three), large 18-inch experimental guns, each weighing 150 tons, for work on the coast. Probably it was largely gentle chaff, as such a gun—about 70 feet long—almost defied a design of railway mounting for its transport, and road transport appeared to be impossible. However, I clinched the bargain. The main point was that such guns mounted at Westende could command the Zeebrugge locks and Bruges docks. It was confidently hoped that Westende would be in our hands before the autumn, so that there was every chance of, at last, making Bruges impossible as a harbour. With such an object in view, I was determined that no difficulty should defeat us. Ostend had already become almost useless to the enemy. Every photograph, after our bombardment, showed the harbour deserted by all ships and destroyers. Of course, there may have been one or two submarines inside their shelters, but to all intents and purposes the harbour was deserted. This state of things could be assured and maintained by our 15-inch guns, and, if necessary, the 12-inch guns at Adenkerke. Bruges, meanwhile, flourished as a seaport town, and would do so as long as the Zeebrugge lock-gates were intact, and the harbour itself not under our gun-fire ; but, with these two commanded, the enemy would be in a sorry plight. The mounting of 18-inch guns was a worthy problem to tackle, since the results would be of such promise.

The difficulties were great, since the guns, if mounted at Westende, would be right under the nose of the enemy. His medium guns could all be brought to bear at comparatively short range on the emplacement, and his aeroplanes would be in a position to observe any erection work while in progress. Moreover, the transport of loads of 150 tons' weight was no child's-play. However, steady thought cleared up the difficulties, and the following plan was evolved.



THE TIRPITZ BATTERY.

Showing the result of the bombardment at 16 miles by 12-inch Mark X gun. The guns can be seen inside the four white concrete emplacements. It will be seen that all four of the concrete emplacements were hit. The shell-holes near the battery can also be seen.

PLATE XXXV.



9.2-INCH GUN MOUNTING ON A TRUCK FOR TRANSPORT TO THE FRONT.

The Palace Hotel at Westende appeared a suitable camouflage in which to erect the gun positions. A model was made, and two emplacements fitted into the building to hold the guns. The external walls were not interfered with, but concrete sides and fronts to the emplacement up to twenty feet thick were designed to be built inside the walls in order to take the direct impact of the heavy German shell. The minimum of embrasure opening to allow the required traverse was arranged for. The concrete roof of the emplacements was to be built into the building, disturbing existing walls as little as possible until the concreting was completed ; then the interior could be cleared, leaving the upper stories supported on the roof of the emplacement. By this means all building would be carried on under existing cover. A covered way under the road into adjacent buildings would form a means of access without calling attention to the building either by traffic or individuals.

Having settled this point, transport for the guns had to be arranged. This I proposed to do by using one of the landing pontoons,¹ on which a gun and its mounting could be placed and transported at night to a point opposite the Palace Hotel, and run on rails into the emplacement. The levels were ascertained and the roadway worked out at a 5° slope from the gun position to the landing-place, which would be cut down to a height level with the end of the pontoon. It was an easily negotiable incline.

The sea-wall required cutting down, and a sloping way to be excavated just wide enough to take the mounting, and rails had to be laid for the gun to travel over. This would have been done by night work, camouflage covering the ditch in the day-time—for really it was only a ditch. Every day on which flying was possible one of our aeroplanes would fly fairly low over the position to inspect and observe any noticeable marks that might not be apparent to us walking on the ground. These would at once have been adjusted. The most

¹ See Chapter IX.

minute attention to detail to ensure secrecy would have been insisted upon. No troops or civilians were to be allowed near the place—in case of spies or prisoners being taken by the enemy who might have given away information. The workmen were to be brought up from the back areas every morning before daylight, and returned after dark, and other similar precautions taken.

It now remained to design the mountings, and, while digesting the problem, events were gradually casting the shadows of doubt over the eventual ability of our troops to win through the advance to Roulers. It seemed to me, therefore, wise to have an alternative use for the guns, namely, to design the mountings either for shore work or for mounting in the monitors. My idea was to mount each gun on the after-end of the superstructure on a mounting capable of 15° of traverse and 45° elevation; not to humbug about with elaborate magazines and shell-rooms, but to stow the cordite in water-jacketed water-tight cells erected on the superstructure. This jacketing was for two purposes: one to extinguish any fire started by a shell or bomb, and the other to preserve a constant temperature of the cordite at any degree of temperature required, this being most necessary if the firing took place either in the extreme heat of summer or cold of winter. The shells were stowed on the upper deck inclined at about 30° to the vertical on account of their length, and sufficiently apart to ensure one not detonating the next in case of one being directly hit by a bomb or high-explosive shell. The actual proposals put forward were:

- (a) To strengthen and support the forecastle decks, and work-in the front pivot girders and rear-supporting girders.
- (b) To pocket this deck for a length of twenty-four feet to allow for recoil at maximum elevation.
- (c) A camouflage of thin plating to represent armour in the air-craft photographs.
- (d) A plain push-and-pull cylinder (elevating cylinder with trunnions vertical) for training through 20° .

(e) A good windlass aft to work a bower anchor and chain aft, of the same size as the bower cable and anchor of the ships, together with chain locker.

(f) The shell to be stowed on the upper deck, point up under the 1" forecastle deck, as a protection against bombs, and provided with suitable nose-caps.

(g) The cordite cases to be stowed on the forecastle deck, spaced apart to prevent one deflagrating the next; if possible in a water-jacket, steam-heated to keep up the temperature of the cordite in winter.

(h) Sufficient ammunition for the day's firing, about sixty rounds only, would be embarked. Such a stowage of ammunition should be far safer than the present monitors' magazine and shell-rooms.

(i) The loading arrangements to be those as for the land mounting—two winches for hoisting shell only would be required in addition.

(j) A pressure-pipe from the present hydraulic system would be led to the gun.

(k) None of the present armament to be disturbed.

(l) Indicators from the present director to be taken to the gun, which would be laid by clinometer, much on the same principle as is now employed.

The ships should be taken in hand after the cessation of military operations if the offensive on the coast failed.

Sir John Jellicoe approved the above suggestions, and the ever-ready Mr. Gard, of the Department of the Director of Naval Construction, froze on to the problem of adapting the ships to hold the mountings, not by any means an easy task, since supports had to be erected and built in from the keels up to the superstructure, stiff enough to stand the heavy recoil stresses. A suitable position was, however, selected.

As regards the design of mounting for shore work, the height of the mounting had to be considerable to get the required elevation, and yet to allow the breech to traverse. It appeared

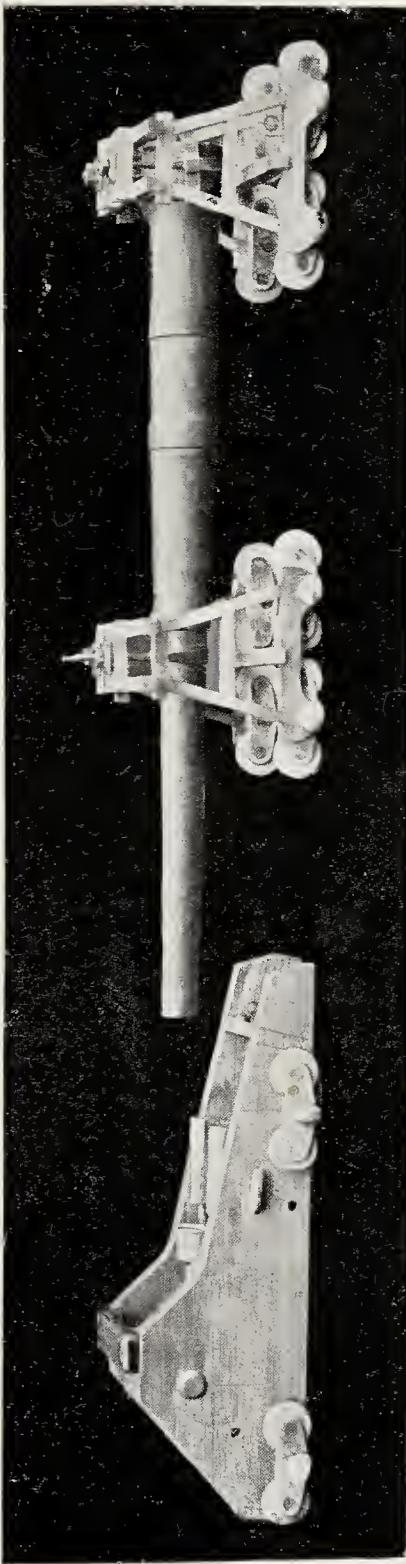
advisable to reduce the weight of the carriage on transport by dividing it into two portions, the lower part containing the central pivot and back traversing plate, and the upper part consisting of the side-girders. The gun could be most easily transported when slung from two travelling goliaths, whose wheels were flanged for railway transport. Models were made at Dover, and Messrs. Armstrong, Whitworth & Co. were put into communication with me—their chief designer visiting Dover. All the various points were discussed, and the mounting, shown by photographs of the model in Plate XXXVII, was decided on. These show the method of transport of the top carriage and the gun, the latter being close on seventy feet long.

For landing, I decided to bring the gun and mounting over on the two bulges of a monitor, on chocks of the required height resting on her bulge, and parbuckle the gun from there on to baulks on the pontoons approximately of the height that the bottom of the gun would be when slung in the goliaths ; then to lift it with the screw lifting-gear into the transport position. The carriage, with the slide in place, would have been skidded from the bulge over the rails, on the pontoon lowered with jacks, and the wheels engaged. The pontoon would have been pushed by monitors at night to the disembarking place, the nose of the pontoon hove into position, and the fish-plates connecting the rails on the pontoon to those ashore bolted in place. The mounting, and then the gun, would have been hove into position in the emplacement and mounted.

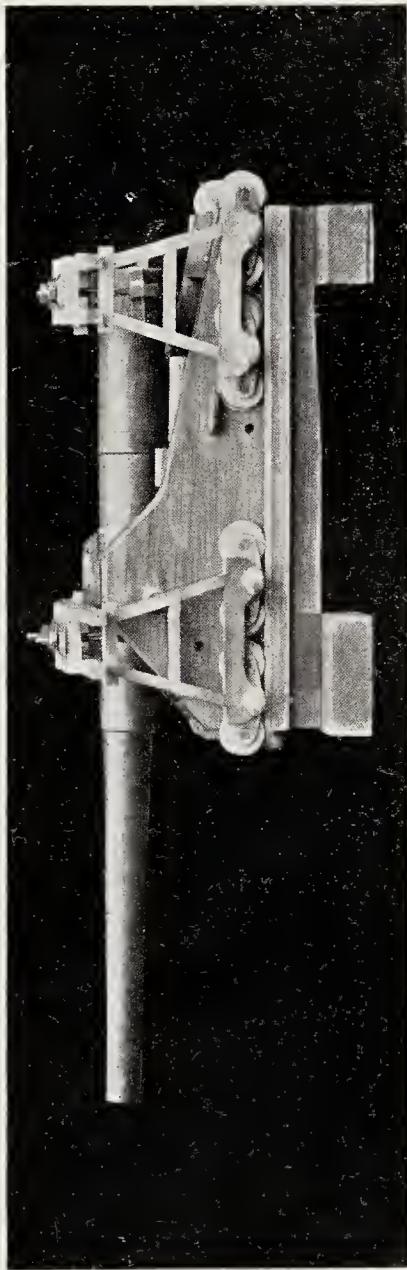
A fine day for firing would have been chosen, and the Zeebrugge lock-gates first attacked, as it was more important to destroy these than to attack the Bruges locks.¹ Firing would have continued without check so long as the weather and the wear of the guns permitted, in order to complete the destruc-

¹ The shooting of the 18-inch guns from the shore emplacements should have been so accurate that the destruction of the lock-gates should have been a matter of comparatively few rounds.

MODEL OF 18-INCH 150-TON GUN AND ITS MOUNTING.



View showing gun supported by two goliaths ready for running into its mounting.



View showing the gun run on to its mounting.

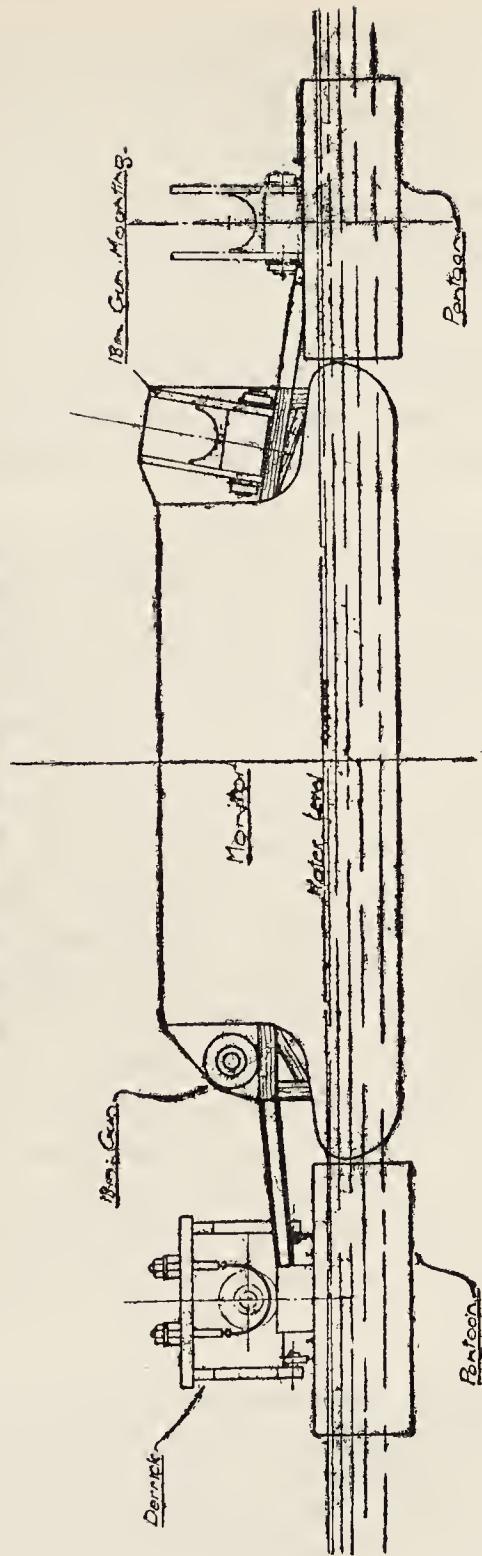


SMOKE BOATS.

The original smoke-screen was made from small boats towed, before motor launches were supplied.
PLATE XXXIX.

— DIAGRAM SHOWING SEA TRANSPORT OF 18 INCH GUN AND MOUNTING. —

— METHOD OF TRANSFER TO PONTOON. —



tion before the enemy had time to bring up heavy guns on railway mountings. Tirpitz would, of course, have opened fire, but the 12-inch and 9·2-inch shore guns should have checked his fire, and in any event the twenty feet of concrete and adequate sand protection would have proved a sound defence.

The coast was never taken, so this programme was never carried out—another of our many disappointments. The mountings were built, but long delays appear to have taken place, and instead of being completed in May 1918, as they should have been, they were not all installed in the monitors before the coast was evacuated by the Germans in November 1918.

The programme for the use of these heavy guns at sea was to moor the three monitors behind a smoke-screen at a point 24,000 yards from the lock-gates, and dead in line with the canal, first attacking the lock-gates and then the Bruges docks. In case the enemy put up a smoke-screen, the canal would have been used to correct for direction; and definite spots on it to correct for range—dropping the requisite amount to the lock-gates, and, from similar points near Bruges, lifting on to the docks. It would have been a record for naval gunnery had it come off. The monitors chosen were those commanded by the three senior captains: the *Lord Clive*, Captain Collard; the *Prince Eugène*, Captain Wigram; and the *General Wolfe*, Captain Moreton; and I am convinced that if the opportunity had offered these ships would in this operation have well sustained their previous reputations.

The following notes, which were sent by me to my successor after leaving the Dover command, give the main essentials of a bombardment of Bruges with the 18-inch guns from the monitors.

“Essential to have command of the air. Arrange this by relays. Fire along the canal so that the direction of fire may be corrected even with a smoke-screen by dropping to an ascertained mark. Have several, as the Bosch will tumble to this method. Have at least six secondary marks of various

ranges and directions, and on to which one ship can drop to correct for the others. Treat all three ships as one battery. *Range* with all ships, each ship using the other's correction, then for *secondary rangings*¹ use one ship only. Fire the life out of the guns. Try, unless you have other data, twenty-five yards loss in range per round for the extra big charge. Apply this each round. Fire at Zeebrugge and Knocke batteries at the same time."

Such, then, was our gun-landing work during 1916 and 1917—full of interest to us and of possibilities which, alas, the hang-up of the Army at Passchendaele prevented coming to fruition.

But the work was not wasted. In all big wars it has been the privilege of the Navy to land larger guns than those generally used ashore; so, in this particular, the Dover Patrol was able once again to uphold an old tradition of the Navy.

¹ Secondary rangings were ranging by dropping to secondary marks when a smoke-screen was put up by the enemy.

THE NAVY AND THE GUNS

The Navy, through the 'istory of Britain's bloody wars,
'As always helped the Army with 'er blooming Ordnance Stores.
They've landed guns to help them, and I'd 'ave you know, m'lud,
They was always one size larger than what the Army 'ad.

During the Indian Mutiny the Army cheered us when
Peel landed 'is ole broadside to be lugged by sailor-men.
The Boer War saw us up to date when Percy Scott, by 'eavens,
'E made extempōre mountings for the naval four-point-sevens.

The Army's got a "Mother" and they've got a "Grannie" too,
So we 'ave got our work cut out to do as we should do.
It must be a reg'lar whopper, so bear a hand, my men,
For we'll land our largest twelve-inch, the fifty-ton mark ten.

CHAPTER VIII

A PROPOSED ATTACK ON OSTEND

A proposal for landing troops prepared at the end of 1915—Some general considerations—Features of the scheme—The naval aspect—Attitude of General Headquarters—Consultation and elaboration of plans—Major-General Hunter-Weston's assistance—Objectives in view—The suggested programme—A new factor—The proposal abandoned.

TOWARDS the end of 1915 I put forward a proposal to the Admiralty and General Headquarters in France for a landing of troops inside Ostend, an operation which might have had important results.

In order to understand the project, the conditions on the coast must be appreciated. The Tirpitz Battery, mounting 11-inch guns of the latest type, had been revealed by our bombardment just to the west of Ostend. Its range then was about 32,000 yards—say 18 miles; that of our monitors' 12-inch guns was only 20,000 yards. All chance of useful bombardment was consequently hopeless. The only other batteries known to exist were some 6-inch guns at Raversyde and the Hindenburg Battery of old 11-inch guns on the east side of the harbour. These guns had been taken out of obsolete German men-of-war. It seemed to me that the harbour might be rushed, the troops landed behind the batteries, the town taken, and hands joined along the coast with the troops advancing from Nieuport.

The landing would have been timed to take place at day-break. Experiments had produced a smoke-screen of reasonable efficiency. Surprise would have been a great asset. I considered the operation feasible from the naval point of view—that is, I was prepared to bring the troops and

monitors alongside the jetties in Ostend harbour ; it was for the military authorities to pass judgment on the feasibility of the subsequent land operation.

I wrote the following memorandum :

" If successful, the results will have far-reaching effects ; much more so than the actual strategical effect on the western theatre of war.

" The political effect of the loss of Ostend and a portion of the coast would be considerable, especially in Holland—a factor which we cannot afford to ignore.

" The possession of the port is important when we consider the conditions which will govern the terms of the Peace, which must be declared eventually. As far as the British Empire is concerned, the only serious result up to date is the loss to the Belgians of the Belgian coast. In no other way are we directly adversely affected. If the Belgians regain their coast, we must, so far as the redistribution of territory is concerned, emerge from the war in a better position than when we entered.¹ If the Belgian coast becomes German territory we will have sustained a loss which we shall never be able to repair. Hence the coast, so far as we are concerned, will be the one great counter against us at the Peace Conference. It is, therefore, of vital importance that we should become possessed of this territory.

" The submarine mine-layers are difficult to combat ; their cunning will probably increase ; their appliances—already sufficiently fiendish—will become more and more perfect ; and it is not impossible that they may cause more loss of life by attack on transports than would result by the operations necessary to possess their nests.

" These preliminary remarks do not, of course, in any way affect the military possibility of the scheme proposed ; but they are, I consider, so important that every reasonable sacrifice should be made to carry some scheme of the nature indicated to realisation.

" The operation proposed depends for its success largely on *surprise*.

" Surprise introduces two risks. The first, that knowledge

¹ We would have gained the German colonies.

may have come to the Germans, and that they may have consequently made adequate preparation. Secondly, that they are able to counter the surprise on the spur of the moment.

"The first argues intense secrecy. In fact, secrecy so great that it may even, by suppression of information, affect adversely the success of the operation.

"The second must be dealt with in considering the details of the proposal.

"But, as regards the former, an absolute minimum of persons only should have knowledge of the fact that the subject is even under consideration."

It was apparent that the operations divided themselves under two heads—one entirely naval, and the other purely military—and that there would come the third phase—that of subsequent supply.

It was within my sphere to examine the naval aspect of the project :

"The NAVAL OPERATION consists of placing alongside the quays a military force of adequate numbers to seize the town and docks and destroy the batteries covering the approach to the harbour, and then immediately bringing reinforcements in sufficient numbers and adequate equipment to jump, in forty-eight hours, sufficient ground to make it safe to hold, and from which further operations may reasonably be expected to drive the enemy from the Nieuport-Ostend coast.

"The naval operation is risky without doubt, but not impossible. Its success lies in surprise—in screening the operation by smoke, and, above all, in the fact that we know precisely what we are doing and intend to do, whereas the enemy do not. They have to judge, in a few precious moments, what is about to happen, and, on the spur of the moment, devise methods of dealing with the problem, the details of which they can only surmise.

"Give them the facts as known to us, and two hours to make preparations, and they should defeat us; but, given merely obscure vision and ten minutes to act in, the chances are in our favour.

"The Admiralty have considered the naval operation, and are of opinion that the chances of success are sufficiently good to warrant risking the ships on the enterprise. But, in putting forward the naval portion as a feasible scheme, it should be appreciated that the operation is not a simple one, and that, moreover, it is one involving considerable risks.

"The operation may, therefore, be considered from the MILITARY POINT OF VIEW as starting with 10,000 men, placed alongside the quays at Ostend in a manner to suit military requirements.

"The position would then be :

"(1) Ninety trawlers, each carrying 100 men, and their machine-guns, divided into divisions of six boats each, are alongside a jetty, 10 feet above the water-level, and the boats are provided with gang-boards so that the men can land quickly.

"(2) Six monitors, each mounting two 12-inch guns, two 12-pr. 18 cwt., one pom-pom, one 3-pr., and two maxims, as normal armament, and additional light guns if considered necessary, would be placed so as to cover with their heavy guns the whole front of the houses.

"(3) One monitor carrying one 9·2-inch, one 12-pr. 18 cwt., one Q.F. 6-pr. and two maxims, to supplement the 12-inch monitors.

"(4) The 12-inch monitors could each carry 300 men, who could walk ashore.

"(5) The large space available on the spar-deck of the 12-inch monitors would permit of extra guns being mounted, or of field-guns being carried, or armoured cars being carried.

"(6) The whole of the reserve ammunition and immediate necessities for the men would be carried by the monitors and landed by their crews where required.

"The whole of the monitors, after the troops were landed, and fire from the front of the houses smothered, would move as necessary to fire on the heavy batteries, ceasing when ordered for the infantry to attack."

The Immediate Objectives are :

"Immediate destruction of the more prominent batteries

by infantry attack and blowing up by R.E.'s, to leave the entrance of the port undefended to allow the mine-sweepers to sweep a channel on the falling tide for the entry of the transports with additional troops, which would be in the offing.

"The next objective is to jump as much ground as possible, since everything depends on the seizing by surprise of the largest areas possible. This should, at all events, include the sluices of the Nieuport Canal to the southward.

"Seizing the sluices will prevent the Germans flooding the ground to the south of the Dunes, or allow us to do so.

"If they are seized, we could flood this ground and most probably starve out the troops in the Dunes, as their exit in the west would be closed if Westende was taken by the French and Ostend held by us. The shore would then automatically fall into our hands. This requires accurate checking to see the exact extent of ground which would be flooded; but, in any case, the German position would be extremely precarious. The country could be subsequently drained if desired.

"The question of street attack on the town requires consideration. It might be desirable, if the troops in the town are considered to be few, to leave this alone while the country is being secured."

Finally, I appended to my memorandum some general remarks :

"(1) The internal defence of the harbour against attack is unknown to me, but no aerial photograph taken of the town or (so far as they have been taken) its environs shows any such defences. I have given instructions to our Dunkirk Aerodrome to take as many photographs as possible round Ostend, to detect the lines of trenches. The blast of the monitors' 12-inch guns alone will break every window facing the harbour. Light guns can be augmented if required. The heavy guns of the monitors can cover the advance on the Tirpitz Battery.

"(2) The time chosen for entering will be grey dawn, so that the flash of machine-guns or rifle-fire should be visible.

"(3) In the Peninsular War it was always said that Lisbon

was nearer to England than to Madrid on account of sea-transport. Similarly, Ostend is really nearer to England than Boulogne is to the front. A division can be transported from Dover or Folkestone to Ostend in three hours, and all its impedimenta carried and landed on wharves which are admirably adapted for the purpose.

"(4) The railway should be available if required.

"(5) The whole success depends on the first jump forward. For this reason it seems to me that the town might be left for the ships to look after.

"(6) An approximate time-table would be :

7	a.m.	Enter the heads.
7.30	„	All boats alongside ready to disembark.
7.45	„	All men ashore, and armoured cars ashore. If the batteries are to be taken by surprise, they will be taken by 9 a.m.
9	„	Batteries taken.
9.30	„	Transports enter harbour, with 2nd Division.
11	„	Troops disembark and move off, and transports leave jetties.
11.30	„	Next lot of transports enter.

The scheme was a matter for critical survey and study. Lord French received the idea favourably subject to detailed examination by his staff. Shortly afterwards Sir Douglas Haig succeeded to the command of the Expeditionary Force, and detailed Major-General Sir Aylmer Hunter-Weston, with Colonel C. F. Aspinall as staff officer, to go into the details. General proposals were provisionally got out.

The naval preparations in connection with the scheme were fairly extensive. Six 12-inch monitors were to enter Ostend between two lines of towed smoke-boats ; each monitor was to have sixteen to twenty trawlers in close company, the whole proceeding in one line. After entering, the monitors were to berth themselves alongside the jetties, or as near the jetties as possible, and use their 12-inch guns to fire into the batteries in reverse, employing machine-guns to assist the troops. Once inside, it was hoped no gun of any considerable

calibre could range the disembarking troops. Plate XXXVIII shows the disposition of the monitors inside Ostend as planned.

No. 1 berth covered the permanent bridge from the jetties across the locks and the other lock bridges to prevent their destruction by the enemy. Shrapnel was to be provided to clear the gardens, and high-explosive shell for dealing with any strong positions. After the troops had made good their landing the Tirpitz Battery was to be ranged with high-explosive shell.

No 2 berth took all the batteries on the east side in reverse.

No 3 berth covered the lock and electric power-station with machine-gun fire to assist the troops in landing and taking that station—and also covered the barracks with the 12-inch guns. After landing this monitor was to fire into the Tirpitz Battery. Arrangements were made for a staff for the power-station, and for an observation post on top of the power-station to be established as soon as possible.

No. 4 berth covered the town and maritime railway-station to prevent rolling-stock leaving.

No. 5 berth covered the houses facing the Bassin de Pêche, for the landing from the trawlers, and then took on the batteries on the east side of the harbour.

No. 6 berth covered the Atelier de la Marine and adjoining jetties, then on to the Wendune and eastern batteries.

No. 1 small monitor was to run into the entrance of the west basin and prevent any submarine leaving, and assist to form a bridge if the ordinary bridge was destroyed.

No. 2 small monitor was to aid as spare to fill up any visible gap.

No. 3 was to fill the same mission.

The monitors' billets were numbered as above in order of relative importance, and were to be filled by the ships in that sequence. That is, any disabled monitor had her place filled by her next astern. In entering, all the monitors were ordered to fire into the batteries to the eastward of the harbour. The estacades were 490 yards long, which at eight knots gave

time for two rounds from each gun. This would have been high explosive; after which the guns were to be loaded with shrapnel set for zero.

The main function of the monitors was to keep down rifle and machine-gun fire with shrapnel or high explosive. It was anticipated that, it being semi-dark, the flashes of machine-guns from the shore could be spotted with some degree of certainty.

The trawlers and monitors had bullet-proof bridge positions. They were permanent in the case of monitors, but, for trawlers, plates were supplied which were cut to shape and fitted with the necessary securings so as to enable them to be placed in position by the crews in twenty-four hours. Each division of trawlers had a distinctive funnel painting, the six divisions in proper order having—red, green, white, red red, green green, white white. The monitors were to show similar distinctive stern lights to guide their division.

It was estimated that the average carrying weight of the Dover trawler was about 300 tons, exclusive of 30 tons of coal in the bunkers, and the draught about 14 feet aft.

The general military arrangements forecasted for the operations were as follow:

(1) The operation had in view—after the enemy had been shaken by a combined French and British attack from Nieuport and Ypres respectively—to land a force of three divisions at Ostend with the object of:

(a) Joining hands with the British force advancing north from Ypres, and thus completing the overthrow of the enemy's right flank.

(b) Opening a new line of supply, based on Ostend, for the further prosecution of the campaign.

The operation was to consist of four distinct stages:

Stage 1.—Embarkation of the advanced guard in trawlers and monitors at Dover, and landing them by surprise at Ostend Harbour at high tide the following day.

These were to capture the harbour, to turn such of the

surrounding coast batteries as could prevent the arrival of the main body, and to seize the bridgehead on the arc De Haan—Vijweghe—Passchendaele Canal—enemy's reserve trenches N.W. of Leffinghe, with the posts as far in advance of this line as possible.

The force was to consist of : Advanced guard, 1st Divisional Headquarters, 3 Infantry Brigades, 3 Field Companies Royal Engineers, 4 Divisional Cyclist Companies, 5 Motor Machine-gum Batteries, 16 18-pr. guns, 12 4·5-inch howitzers, 22 armoured cars, 16 Tanks.

Every advantage was to be taken of the initial surprise. Troops were to be pushed forward with the utmost vigour, giving the enemy no time to rally. Special detachments of infantry, cyclists, armoured cars, etc., were detailed beforehand for the capture of all important points, and these units were to proceed independently to their respective objectives, at utmost speed, immediately they had disembarked. Other parties were detailed to follow in rear to clear the town of any hostile troops left behind. As soon as the defensive line on the canal was held, armoured cars and cyclists were to push forward and gain as much ground as possible in anticipation of the arrival of the main body.

Stage 2.—After the coast batteries had been seized, the disembarkation of the fighting troops of the 2nd Division with a proportion of its own and the 1st Division's transport. These troops were to embark in channel steamers at Havre simultaneously with the embarkation of the 1st Division at Dover, and were to enter Ostend as soon as the coast batteries were subdued—probably at about 7 a.m. (N.B.—Channel steamers were essential, as the ships must be able to enter harbour at low tide.)

Task : To push southward with the 1st Division to gain touch with the British force operating from the direction of Ypres.

Stage 3.—Disembarkation of the fighting troops of the 3rd Division arriving in sea-going ships from Havre, with a

proportion of transport. These ships would not be able to enter the harbour until the afternoon tide.

Task : To reinforce the 1st and 2nd Divisions and confirm their success.

The amount of transport to be taken in Stage 2 was governed by the capacity of available shallow-draught ships. It would just have given the troops the requisite mobility for the initial stages of the operation, and enabled them to maintain themselves, if necessary, at a distance of six miles from Ostend Harbour, *i.e.* De Haan, Ghistelle, Middelkerke. The 3rd Division was placed on the same scale.

Stage 4.—Arrival of the heavy transport and non-fighting units of all three Divisions, by road from near Dunkirk.

This stage could not take place until the day following the disembarkation, as the roads would not have been available until at least twenty-four hours after the enemy's troops between Nieuport and Ostend had been dispersed. Bringing the heavy transport by sea to Ostend instead of by land was abandoned for the following reasons :

(a) A very large number of ocean-going ships would have been required ; embarkation at Havre would have taken several days, and secrecy would have been impossible.

(b) Disembarkation at Ostend would have been very slow.

(c) When once the German right flank had been swept back, the transport could arrive more quickly by land ; and until this had been done no more transport than had been landed in stages 2 and 3 would have been required.

The details of the naval preparations were :

1st Day.—An advance by the army down south. Monitors bombard Zeebrugge, Westende, and Middelkerke one hour before daylight.

2nd Day.—Attack Middelkerke.

3rd Day.—Nothing particular.

4th Day.—Monitors stay at Dunkirk and neighbourhood.

At midnight cut Dover off from the world ; all outposts doubled ; no one allowed to leave the town on any pretence ;

all telephone and telegraph under military supervision; all outgoing mail opened and censored; no vessel other than a man-of-war allowed to leave, and then only such as would have no communication with the shore.

5th Day.—Monitors fire at Westende. Troops having had a good night on 4th, arrive at Dover at noon on 5th. Trawlers start shipping their bullet-proof protection, taking in gangways and ladders and preparing for troops. All the gear for each division had been previously stowed in railway trucks painted the divisional colour.

At dusk on the 5th day the trawlers were to leave to rendezvous their monitor off the South Goodwin. The orders for the trawlers gave the approximate times of course alterations. (They had had their compasses corrected for northerly and easterly courses.) No signals for altering course would be made. They had strict orders not to stop and help other trawlers. Drifters were in company for the purpose. The one business of the trawlers was to follow the stern lights of their particular monitors.

The drifters were to lay nets from the Ratel to the Middelkerke bank to worry submarines from Zeebrugge; and, after the batteries had been taken, to zareba from the entrance to Ostend to the Nieuport bank, to protect the transports coming from West Deep on approaching Ostend.

The difficulty of hitting off the harbour exactly was, of course, appreciated. Special tripods had been laid out on the bank near the Ratel; these were to have been provided with search-lights worked from small vessels anchored near. Arrangements were made for a special light on the beach near Nieuport. A motor-launch with an acetylene lighted buoy was to steam in to within sight of the heads, and drop the buoy which had a floating tail which kept the light pointing seaward and not landward.

One danger, which was expected, was that we might find mines, which would be fired from the shore by electricity. These would, of course, have electric cables attached to them.

A submarine was, therefore, fitted with an explosive creep to creep for the cables and destroy them. The trial gave promise of ultimate success.

It was intended to lay mines in lines perpendicular to the shore to hinder enemy submarines arriving from Zeebrugge. Of course it was hoped that Bruges would soon have been brought under fire, and that Zeebrugge would have fallen before Bruges could become a formidable submarine base.

The smoke arrangements were much better than those known to us earlier in the year; but, as we had no boats similar to the motor-launches, they were not so efficient as later on. Plate XXXIX shows the system adopted—which consisted of old navy and merchant service boats with phosphorus burners towed in a long line to make a side-curtain. The *Apollo* was to tow the boats. She would have attracted most of the fire away from the monitors, being ahead and leading. The boats would have been taken as near the heads as possible, and their towing hawser slipped with an anchor attached. The *Apollo* would then, if not too badly damaged, have led in and rammed the lock-gates of the Bassin of the Atelier de la Marine, in order to get out of the way of the monitors. It is always difficult to berth ships alongside a jetty without assistance from the shore. A method was therefore devised and tried with success by the monitors at Dunkirk of keeping a bight of hawser running from the bow to the stern topped up by two spars. These, when the topping lifts were let go, acted as outriggers and dropped the bight over the shore bollards. Gun-fire of course might have damaged the spars, but the scheme would probably have been an assistance in mooring alongside. Plate XL shows the smoke obtainable from destroyers to assist the towed smoke-screen.

After the above details of the operation had been worked out in close collaboration with Major-General Sir Aylmer Hunter-Weston, and after a good grasp of the main features had been obtained, a conference was held between us, when the military side of the attempt was dealt with by the General

in the light of his experience in the Dardanelles landing. The chief difficulty foreseen was clearing the town, owing to the slow and difficult nature of street fighting with a determined enemy. This was accentuated by the absence of roads to facilitate our surrounding the town. The fire of the monitors on the adjacent houses was not considered of capital value, as ruined houses are often more easily defended than those which are intact.

The landing was perceived to have been on a very small front, which was a most undesirable feature. German reinforcements would probably have arrived from the west, making it necessary for us to rush through the town and hold these on arrival. Although this was feasible, sufficient of our reinforcements would have to follow to assist our troops to hold the enemy reinforcements, which was a difficulty if the enemy meanwhile had established a defence in the town. These difficulties were held hardly to warrant the attempt.

From the naval side, the erection of the Knocke Battery, while the proposals were under discussion, completely altered my original conception of getting behind the batteries, since this new battery with its 12-inch guns was one which could range the jetties at Ostend with great accuracy, and, until it was destroyed, render the landing of the main force impracticable. Keen as I was on the project which I had initiated, I reluctantly came to the conclusion that this new factor rendered success impossible.

From the military and the naval sides, therefore, the project presented difficulties which, in our opinion, did not warrant the attempt. These conclusions were reported to the Admiralty and to General Headquarters. A conference was held with the Commander-in-Chief of the British Expeditionary Force, and it was decided that the attempt to seize Ostend was not to be abandoned, but to be delayed until the military advance had shaken the German hold on the coast.

The result was disappointing, as the abandonment of an operation must always be; but the whole of our labour was

not lost. The project had been of great value in bringing us in touch with such able and experienced officers as Sir Aylmer Hunter-Weston and Colonel Aspinall, and the conferences strengthened our ties with General Headquarters in France. Schemes of a complex nature, in which the navy and army are jointly concerned, are difficult to assess except after considerable study and collaboration. That part of the naval work which appeared to the army to be difficult to us seemed easy ; and again, the difficulties which the army foresaw in the landing in the town, to our inexperience did not seem to be very great. What we learned of the military side of the problem stood us in good stead when we prepared for the Great Landing jointly with Sir H. Rawlinson in 1917.

In looking back I consider the original proposal, from the purely naval point of view, was quite feasible, and that, so far as bringing in the ships was concerned, it would have been successful if undertaken before February 1916. But after that date the Knocke Battery would have so handicapped and delayed the main landing that heavy guns on railway mountings could have been rushed up by the enemy, ruining the whole operation. As a raid it was not worth the risk, although, if the main operation had been undertaken and had failed, and certain batteries such as Tirpitz, and perhaps Raversyde, had been destroyed, a good deal would have been done. But to initiate the attempt solely as a raid would have been unjustifiable.

The range of the Knocke Battery from Ostend was only 30,000 yards, the same as that at which the 15-inch monitors destroyed the Ostend dockyard. A fixed shore battery, such as the Knocke Battery of 12-inch guns, would have wrecked the jetties in a few hours. It is interesting to reflect how the instalment of one single battery by the enemy, fifteen miles from the proposed place of landing, changed the whole aspect of the operation.

CHAPTER IX

PREPARATIONS FOR A GREAT LANDING

General considerations of the position on the Belgian coast—An increasing danger—Memoranda on proposed operations—Survey of the slope of the coast and its ridges—Tide curve obtained by use of a submarine—How the results were plotted—Checking the survey—Finding the points of landing—Monitors interned in the Swin—Memorandum to ships' companies—How Tanks were made to climb the sea wall—Raft extension provided to the pontoons—Composition of the landing force—Preparations for bringing over and loading the pontoons—The operation forecasted—Examination of probability of success or otherwise—Visit of the monitors to Le Clipon—Abandonment of the landing.

THE postponement of the Ostend landing in no way altered my views as to the necessity of wresting the coast from the enemy, and I devoted all the time I was able to devising methods by which the naval forces could assist the army in an advance in Belgium.

I wrote a carefully considered memorandum early in 1917 to urge a land offensive on the coast, explaining fully my views on the general situation and the reasons for so doing. Of course, the fact that an advance of a sufficient extent farther south would necessitate a strategic withdrawal of the Germans on the coast was appreciated. At any rate, early in 1917 I put down my views as to the possibility of a Great Landing on the Belgian coast—not a mere raid, but an important movement. I suggested that, if peace were declared tomorrow, the only territory occupied by the Germans which vitally affected Great Britain was the Belgian coast, and added that if, after the war, this remained in the hands of the enemy, then we should have lost ground vital to the existence of the nation.

"If the Germans are allowed to keep this coast after the war, Holland will gradually fall like a ripe plum into their hands. Direct attack will be unnecessary. Holland will be totally cut off from Europe by land except by passage through German territory. Peaceful penetration and gradual economic absorption will so destroy national barriers that in any future war Holland will at once surrender to the Germans, and the whole coast from Kiel to Nieuport will be in their hands.

"The enemy forces have been permitted to hold the Belgian coast for two years of the war. The advantages given to them by the possession of this coast have not been fully appreciated by them, or felt by us, because they possessed no sea initiative, no instincts of real naval strategy. They are a military, not a naval country. Their sea methods have been military, and not naval methods, and, therefore, they have failed to reap the great advantages that the coast of Belgium has placed within their reach."

The position was an anxious one, and I proceeded to examine the situation in the extreme south of the North Sea.

"I have no hesitation in asserting that, had the Germans had any real sea instincts, they could any day in the last two years have made a clean sweep of our forces in the entrance of the Channel, and until recently could have sunk in one swoop fifty to eighty of our ships in the Downs. They could, moreover, have repeated the operation more than once, and we should have been unable to retaliate efficiently unless protective vessels had been taken from the Grand Fleet to a very dangerous extent.

"Ostend and Bruges provide two harbours which can accommodate destroyers practically in safety from attack.¹ I have previously explained the reasons for the impossibility of destroying these harbours. The large batteries the Germans have installed on the coast prevent the near approach of our vessels. They have no shipping routes to protect, being able

¹ This was written before Ostend was abandoned as a naval base owing to our bombardments.

to obtain all their supplies by rail, and, therefore, they need not have any vessels in the offing. We, therefore, have no objective at which to strike.

"We, on the other hand, have to protect our trade-route to the Thames and our transport routes to Dunkirk, Calais and Boulogne—all within easy striking distance of their harbours. To do this we must constantly keep our forces patrolling at sea. To keep a force constantly on patrol, it is necessary to have in harbour, resting and repairing, a force larger than that keeping the sea. If, therefore, we are always to maintain at sea a force equal in number to that which the enemy can bring to attack us, we must allocate and keep in the vicinity a force nearly three times as great as that which the enemy can bring to bear.

"Such a force is not usefully holding an equivalent number of the enemy, as he need not keep his force continually in southern waters. He can move them from the Elbe secretly and at will, and it must be a pure matter of chance if their advent is discovered, since aerial observation is the only form of reconnaissance available, and this is a rotten reed to trust to in the misty and cloudy area of the Belgian coast.

"The enemy can, therefore, bring down and raid us with vessels which need not remain here, but which can operate in the north at will; he requires no vessels resting, as they merely raid and return to their base.

"We should, for safety, keep at sea a force sufficient to deal with his vessels when they arrive, since it is useless in practice to treat vessels as "supporting vessels" when those vessels are in harbour, as they have to get out of harbour, gather speed, and arrive at the spot attacked. In practice, before this can be done, the raid is over, the damage done, and the enemy well away to his harbours.

"This is the penalty we should have paid more than once during this war for letting the enemy establish strong naval bases close to our main arteries of traffic. The Germans are learning daily; they have improved vastly in sea initiative; and we may expect trouble of this sort before long."

In the light of all these considerations, I suggested that imagination could tell us what would happen in future wars

if the Belgian coast remained in the enemy's hands, and if they, under peace conditions, systematically equipped and organised their bases to harass our eastern traffic in war-time. That the Germans were not going to leave the Belgian coast without being turned out was a conclusion based upon their action in mounting not less than eighty guns of 6-inch calibre and above, on a little stretch of coast twenty-five miles long, in continuing to increase the number, and in digging, concreting, and doing all they could to make the place impregnable. "In fact," I added, "*they are turning the northern part of Belgium into a fortress.*" I was of opinion that the Germans could be turned out then, but that in a few months the task would be one of great difficulty. "Now that we are in the zenith of our power," I urged, "is the time to do this. It is useless to leave it to be talked about at a peace conference. We must turn them out first, and talk about it afterwards."

I suggested that, if the enemy were left in possession of the coast, in the following winter the force at Dover ought to be doubled, adding that this was ^a physical impossibility, as there was no harbour accommodation for such an assemblage of ships, and we should therefore be in a bad way. Dunkirk would most probably have to be given up as a supply base, and we might expect vast losses in our Thames traffic. On the other hand, if the coast were taken, the Dover Force could be largely reduced and the surplus used to protect our shipping elsewhere.

Moreover, the air raids had pointed a sound moral; we had air raids because North Belgium had been allowed to remain in German hands. "Sea raids are difficult enough to stop, but it is far harder," I pointed out, "to stop air raids than sea raids. The enemy machines may start flying east, then circle round and fly west, strike our coast where they wish, and return to any aerodrome or even any level field in their possession, afterwards flying back home at their leisure." Our patrols could not forecast their movements. Whatever the developments of aeronautics might be, our danger during

the war would be enormous so long as we left North Belgium in German possession. Raids could take place in summer about two to three days a week. What did the Germans care for the loss of half a dozen raiding machines, so long as some got in and caused discontent and agitation? The country, in short, was beginning to get a foretaste of the results of faulty strategy in allowing an island to be flanked at close quarters by hostile territory.

And, in closing this memorandum, I wrote:

"There is a school of thought which wishes to leave all offensive action on our part to the next year.

"A most plausible doctrine! At present their teaching is to wait till America is strong enough to come in and help us. This would impress me more if the same school had not suggested last year delaying offensive action until this year, so as to allow time for Russia to be strong enough to give us more help. The trend of affairs in Russia lays bare and exposes the fallacy of this seductive argument.

"'The wait till some one else is strong' policy leaves out of consideration the numerous changes and chances of all detrimental factors in the allied countries.

"Now is our great chance to strike strongly, while we are on the top crest of our strength, and, undoubtedly, the one thing we should accomplish with the least possible delay is to turn out the Germans from the Belgian coast and deny them any access to the sea on that part of the continent that flanks so closely the east coast of England, the Thames, and the Channel.

"If we fail in doing this, we will be cursed in future years for having failed to appreciate the strategical truths which our ancestors so clearly saw, and for which they fought so hard."

In fact, the whole of our strategy had been a big gamble. Our position at sea should have been a weighty consideration in relation to the strategy of our armies. It was assumed that we were all-powerful at sea, whereas we were not so in reality. The defence of our commerce from Land's End to the Thames, as well as the whole of our transport of men and

munitions to the Continent, was at the mercy of the enemy, and no action was taken by the allied armies to safeguard this by retaking the Belgian coast. Both Lord French and Sir Douglas Haig urged the necessity of such action, but it was not till 1917 that any attempt was permitted. Then, instead of the whole energy of the Allies being thrown into the project, it was largely left to the British Army alone to make the attempt. Had we been fighting a country with any sea instinct or initiative, we might quite possibly have lost the war through deliberately allowing the enemy to establish himself in Belgium, and fortify harbours within easy operating distance of our Channel and cross-Channel communication.

Such was the situation in 1916 and early in 1917—always waiting for an advance along the coast. In the meantime, constant thought was concentrated on the general landing problem in order to find the most suitable place and devise the best methods for carrying it out.

The foreshore was the only possible place for landing on a broad front. To the west of Ostend the shore was protected by a sea-wall; to the east by sand-dunes reaching from high-water mark to well inland. A landing to the east of Ostend was possible; but, when once launched, the difficulty of sea communications arose until the coast batteries had been taken, or unless an advance along the coast was carried out from Nieuport, and the two parties joined hands at Ostend. The prospect of landing to the westward and scaling the sea-wall was not a pleasant one, but it had the main element of success, namely, surprise, markedly present. It seemed so impossible that it would not be expected by the Germans, and therefore would probably be easier than a landing in an apparently more favourable locality. The 30-foot sea-wall sloping at an angle of 30° , with an overhanging buttress three feet high, of semi-circular coping stone overlooking the landing, formed a natural fortress.¹ This, armed by machine-guns and rifle-fire, would

¹ Plate L.



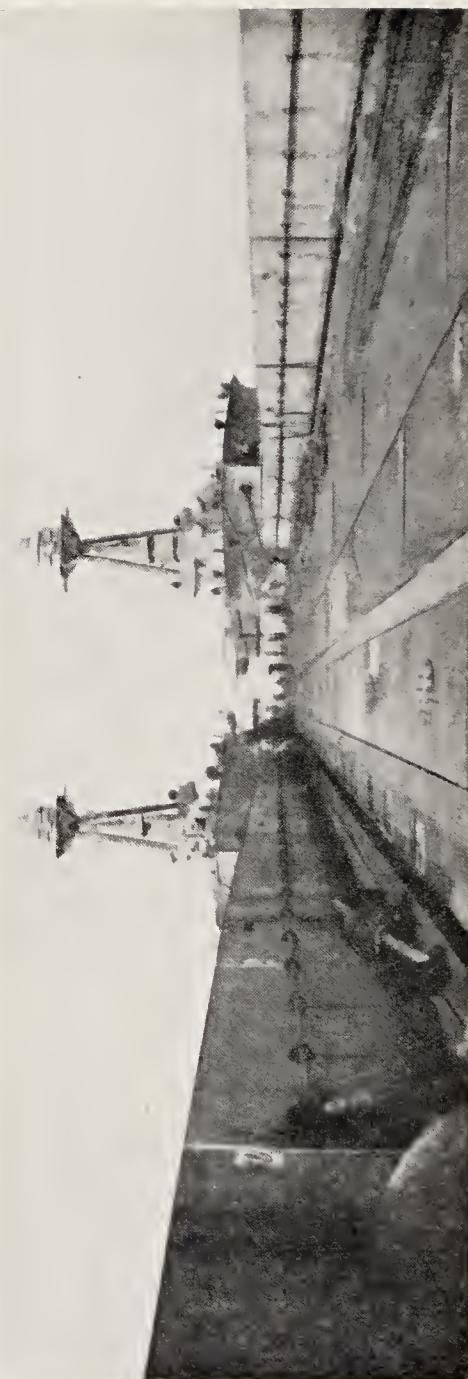
DESTROYERS MAKING A SCREEN WITH THEIR FUNNEL-SMOKE.

PLATE XL.

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A PAIR OF MONITORS PUSHING IN A PONTOON 560 FEET LONG AHEAD OF THEM, AS A PIER FROM WHICH TO LAND TROOPS.
These pontoons were 2,500-ton structures.



VIEW FROM FORE END OF THE PONTOON, LOOKING TOWARDS THE MONITORS.

appear to the enemy to be almost impregnable, unless he mentally visualised the paralysing effect of smoke on the defence. Our smoke experiments had advanced so rapidly and satisfactorily that every hope existed of landing in an artificial fog.

The method of landing was of great importance. The Gallipoli landings had shown the dangers and difficulties of landing large numbers of men and material in open boats.

The following is roughly how the scheme developed in my mind.

The first and obvious idea was to have landing-piers constructed, which would be towed into position by vessels alongside them; the piers, after touching the beach, would have their sea-ends held up against the tide by anchors. But even supposing these in place, the troops would still have to be got on them. The idea then expanded into one of monitors going alongside the pier; but, to obtain the necessary draught of water to float a monitor, the piers would have had to be 300 yards long. If the monitors poked their bows against the ends of the piers instead of going alongside, 100 yards would be saved, and the men could tumble over the bows on to the pier.

But how were the monitors to be got into position with the pier? How would it be possible even to ensure getting the bows of the monitor up to the pier with a strong tide on her beam? Why not let the monitor come in and push the pier ahead? In this idea lay the crude solution of the problem. It seems now a simple and direct line of argument, but it took me days and days of thought to evolve it. Gradually the problem cleared until the arrangement shown in Plates XLI and XLIII was devised, whereby a pier 200 yards long was to be pushed ahead of two monitors lashed together. The reasons for using two monitors were the following:

(a) Greater spread to the guys, steadyng the pontoon to the monitors.

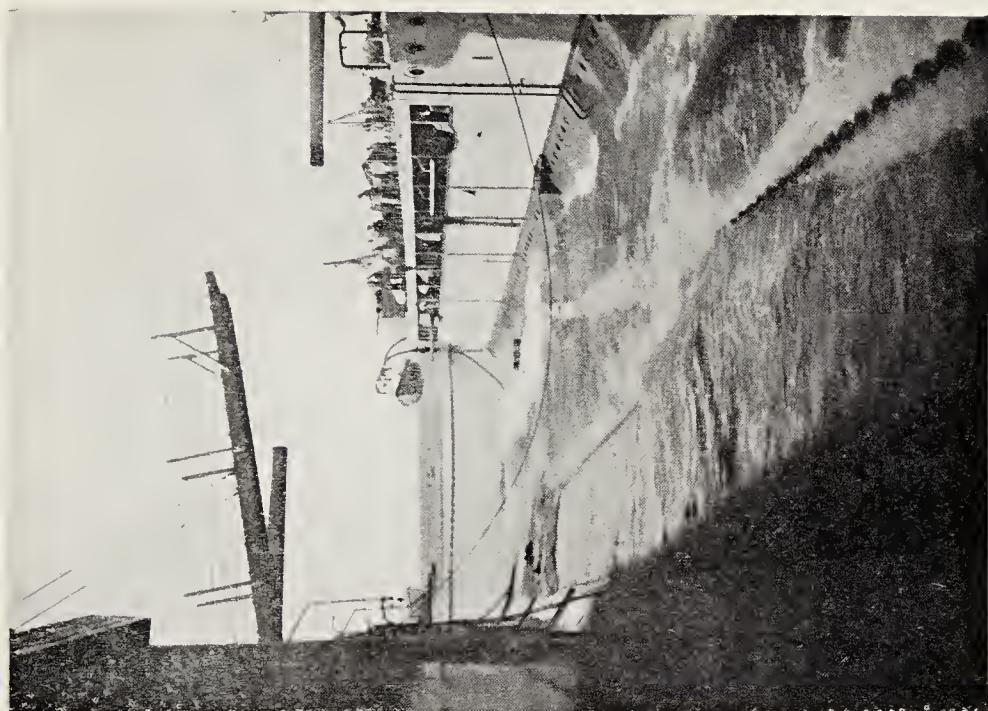
(b) Greater command in manœuvring owing to the increased horse-power and greater distance apart of the propellers of two ships compared with those of a single ship.

(c) An increase of speed.

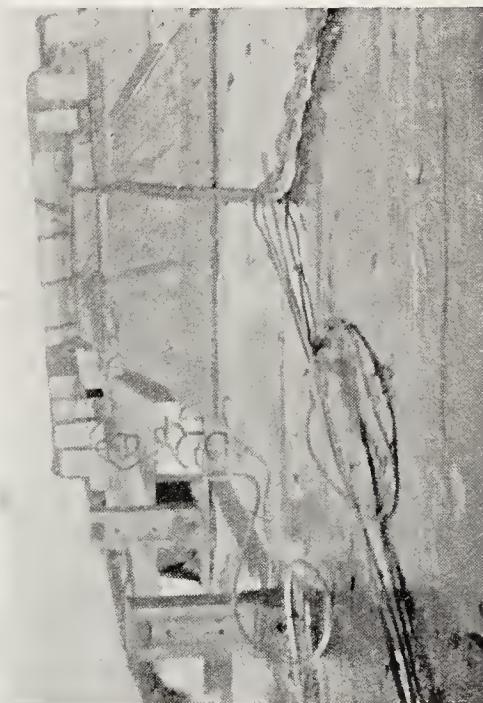
To force a monitor through the water at a speed of six knots requires the use of only half her total horse-power. Therefore at this speed the other half of her power was available to force the pontoon ahead of her, or, by using two monitors to push a single pontoon at six knots, a power equivalent to the full power of one monitor was available to propel the pontoon.

The shape of the pier, or pontoon as it might be more correctly styled, required consideration, as it had more or less to fit the slope of the shore. The draught of water of the pontoon at the sea end had to be the same as the forward draught of the monitor, viz. 9 feet. The draught at the shore end was fixed at 18 inches. The slope of the beach was obtained by photographs in a manner that will be described. Suffice it to say that, in order to get these draughts of water at each end, the length of the pontoon had to be 550 feet—a convenient beam of 30 feet was fixed for the pontoon. This proposal was originally put forward in the autumn of 1916, while Sir Henry Jackson was First Sea Lord. He broadly agreed with the arrangement, but the building of such pontoons was a serious matter, and until the Commander-in-Chief in France was reasonably certain that a Flanders advance would take place, it was obviously unwise to throw such an additional strain on the ship-building programme. Pontoons of this description were in reality 2,500-ton ships.

The scheme, however, was worked at and outlined in general detail, and brought to a practical form. At the end of 1916 Sir John Jellicoe succeeded Sir Henry Jackson as First Sea Lord, and agreed with the proposal, provided that the British army were going to advance. I visited Sir Douglas Haig at G.H.Q., and unfolded the plan for landing by surprise. He agreed, always supposing that the main army reached



MONITORS LASHER ALONGSIDE EACH OTHER TO PUSH
THE PONTOON.
Observe the wash made by a destroyer steaming fast close by them.



THE RAFT EXTENSION TO PONTOON.
Observe the pillars are raised as would be the case at sea. See also
the sinuous motion of the raft owing to the "wash" of a destroyer
steaming near.

PONTOON FOR LANDING TROOPS.



MONITORS ARRIVING TO LASH UP TO A PONTOON.



PONTOON SECURED IN POSITION AHEAD OF MONITORS.

The monitors are now riding by the pontoon, which is secured to a buoy.

PLATE XLIV.

Roulers and threatened Thourout. Steps were at once taken to build one pontoon for trial, and press forward with the details. Mr. Lillicrap, one of the most talented of the naval constructors at the Admiralty, was detailed by Sir Tennyson d'Eyncourt, Director of Naval Construction, to work out the details of the pontoon.

It will be appreciated by all conversant with the stresses to which a vessel is subjected, even in a slight sea, that the design of a structure of the above dimensions was not particularly easy; but the energy and skill that Mr. Lillicrap brought to bear on the problem resulted in all the constructional difficulties being overcome.

Colonel Macmullen, D.S.O., was detailed by the Commander-in-Chief to assist in detailing the military side of the operation, and was of great assistance in the preparation of the scheme. Of course the problem from the naval point of view was not plain sailing. No one had ever tried to manœuvre two ships lashed together with a proboscis 550 feet long and with 2,500 tons displacement, ahead of them. I was convinced we could do it, and Sir John Jellicoe, with his usual insight, backed me up.

One pontoon was built and tried in the Swin Channel at the entrance to the Thames in March 1917, which rapid building was due to the energy of Mr. E. J. Maginnis, Chief Constructor of Chatham Dockyard. Everything at first went wrong. Provisionally, a small vessel was placed on each side of the pontoon to assist in steering, and the hawsers to the monitors were kept slack. This method was not a success. The guys were therefore hove as taut as possible, and the ships manœuvred with the pontoon rigidly attached to them. In this case the wires parted, but fortunately the high steering position of the monitors enabled a good view to be obtained, and I saw that the wires parted on steadyng the ship owing to the jerk on them caused by the unavoidable slack, and the sideway velocity of the pontoon, and not to the steady strain during actual turning. The remedy was obvious—namely, the

use of chains. Chains were got out to replace the wires, and after this there was no more trouble. The ships turned quite reasonably well, and a speed of approximately six knots was obtained. The pontoon-cum-monitor scheme was now an assured success.¹ The other two pontoons were immediately commenced and hurried forward with all despatch.

It was necessary to obtain the slope of the coast with considerable accuracy, especially as the photographs taken at low-water showed ridges in the sand. This meant that the slope was not even, and therefore a wedge-shaped pontoon, such as that designed, might have difficulty in grounding owing to the uneven nature of the beach. These ridges can be well seen in Plate XLVI. If the ridges were too high, the pontoon might ground on a ridge and have too deep water under its bow, for the men to land in. The landing, of course, would be timed to take place at high water. The fall of the tide on this coast dries the shore for about 275 yards from high-water mark, so that all the sand which at high water would be under the pontoon and the forepart of the monitors could be seen at low water. An obvious method of survey was available. Briefly this may be described as follows.

When the tide began to fall, with each foot of fall in height, the edge of the receding water formed a visible line along the beach. It was only necessary to photograph the shore at each foot of fall of the tide for the edge of the water in each photograph to fix a contour line which gave successive positions on the beach corresponding to every foot below high-water mark. Of course it was impossible to hit off such times exactly, but this was immaterial if the height of the tide when the photographs were taken was known, as a general section of the coast could be plotted, and the intermediate results obtained.

Now, to know the height of the tide at definite places on the coast, was a matter of some difficulty. The times and heights of tide at Ostend were known : at Nieuport all that was known was that high water occurred about twenty minutes

¹ Cf. Plates XLI, XLII, XLIII, XLIV, XLV.

PONTOONS FOR LANDING TROOPS.



Showing staging for troops to pass from monitors to ladder-way and to pontoon.



Bottom of the ladder-way and staging over the bulges of the monitors—leading to pontoon.

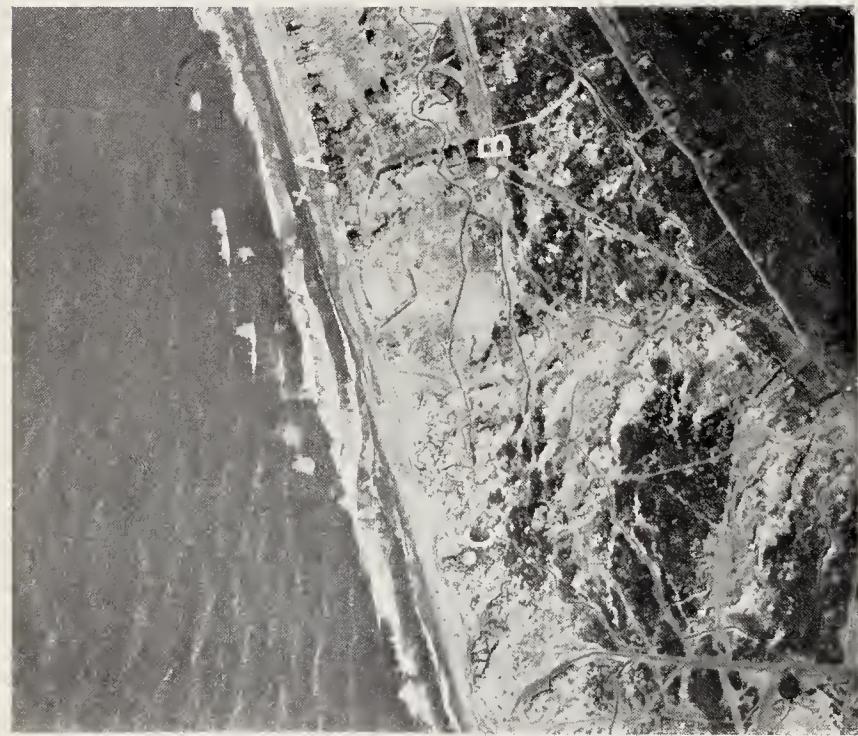
PLATE XLV.



TWO HOURS AFTER HIGH WATER.

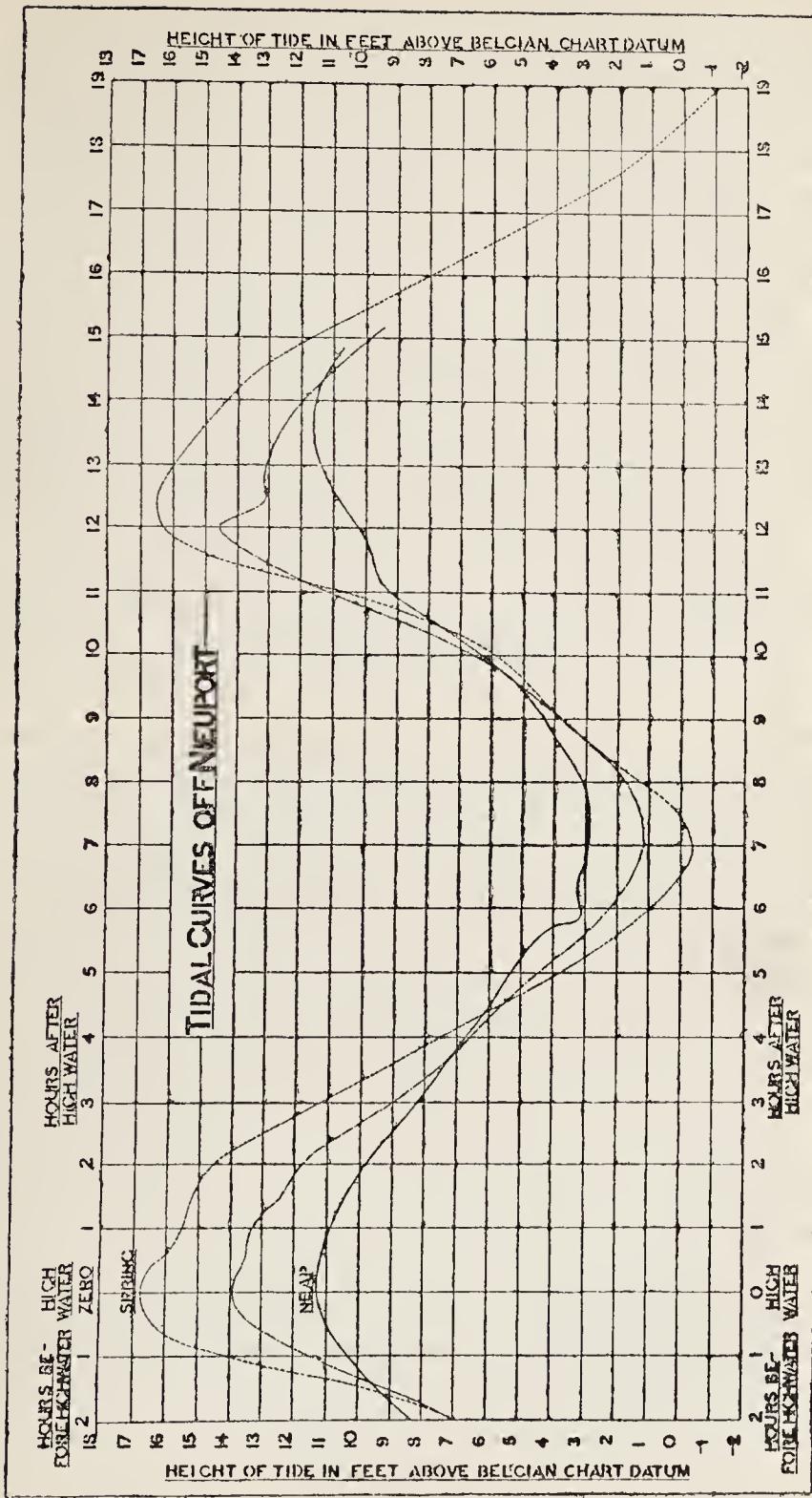
TWO PHOTOGRAPHS (2 OVERLEAF) OF THE BELGIAN COAST AT WESTENDE, TAKEN AT VARYING HEIGHTS OF THE TIDE FROM 14,000 FEET UP IN THE AIR.

By this method the slope of the beach was surveyed within an accuracy of 6 inches, although the photographs were taken from nearly three miles up in the air.



HIGH WATER.

PLATE XLVI.
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earlier than at Ostend ; but its maximum height and the rate of fall during each hour were unknown. At Dunkirk, again, where the times and heights were also known, the times were an hour different from those at Ostend, and the heights again varied. To interpolate, from these scanty data, the times of high water and the heights of tide at intermediate spots on the coast, was impossible.

It was necessary that our survey should be accurate to within six inches. A submarine was, therefore, sent to submerge off Nieuport, to lie on the bottom, and to register the height of water above her hull continuously for twenty-four hours by reading the depth-gauge. The rise and fall and the tide-curve at this spot was thus obtained at springs, neaps, and intermediate tides.

This information was obtained by Lieutenant Wardell Yerburgh. It was a weird experience for the submarine to steal up and submerge right under the guns of the enemy's coast defence, always with the off-chance that in her journey to the bottom she might settle down on a mine. Also, as the submarine was a C-boat, and not large, and as she had to remain submerged for twenty-four hours, she was apt to get stuffy. The number of her crew was therefore reduced to a minimum.

Small corrections of the height of tide registered were necessary, due to variations in the trim of the boat and her heel while lying on the bottom. Difficulty was also experienced in checking the depth-gauge before and after the trip, and obtaining the absolute error in its readings. All these troubles, however, were overcome and every care was taken to obtain the greatest accuracy possible. Times and depths were taken for each three inches fall of the tide.

The photographs of the coast, of which four are shown in Plate XLVI, were taken by pilots and observers of the Royal Naval Air Service, who hovered in the vicinity and took exposures every twenty minutes in spite of the anti-aircraft fire. Many dozens of such photographs were taken, not only



LOW WATER.

FOUR HOURS AFTER HIGH WATER.
TWO PHOTOGRAPHS OF THE BELGIAN COAST AT WESTENDE, TAKEN AT VARYING HEIGHTS OF THE TIDE FROM 14,000 FEET
UP IN THE AIR.

By this method the slope of the beach was surveyed within an accuracy of 6 inches, although the photographs were taken from nearly three miles up in the air.



PLATE XLVII.



MAJOR-GENERAL
MONTGOMERY, C.B.,

LIEUT.-GENERAL SIR HENRY
RAWLINSON, BT.,
K.C.B., ETC.

COL. McMULLEN, D.S.O

in the vicinity of the three points selected for landing, but also to the east of Ostend, in order not to set the enemy inquiring what we were doing at this particular part of the coast. The measurements, reductions, and plottings were done by Lieutenant Hercus, R.N.V.R., my New Zealand scientific Flag-Lieutenant. I believe the Dover Command was the only one in the history of the world to have a scientist as scientific Flag-Lieutenant on the Admiral's Staff. The work involved, as illustrated by Plate XLVI, was briefly as follows :

A base line such as b c between two well-defined points was accurately measured and compared with the same two points of the *plan directeur* (Ordnance Survey). The scale of the photograph was thus obtained. A point on the shore, "A," opposite the proposed spot for landing, was selected for a datum-mark, and the distance to the edge of the water, shown in the photographs by a cross,¹ was measured. The exact height of the tide above low water at the time the photograph was taken, gave the height of this spot above low water. This was done with every photograph and at each of the three landing-places, so that, as the tide rose and fell, spots were fixed at varying distances from the datum-mark at easily calculable heights above low water, since the times of taking the photographs, the tide-tables, and the curves we had obtained, gave the heights above low water.

Plate XLIX shows the section for each landing-place. For convenience, the scale of the horizontal distances in the diagram is one-tenth of that of the vertical heights. The dotted outline represents the monitor's bow and the pontoon. Their position as regards the contour lines is that at high water with a 15-feet tide. These are of course similarly scaled. As the rise and fall of the tide when landing was possible was from 14 to 16 feet, and the draught of the monitors only 12 feet, the shore was surveyed to a distance well under where the bows of the ships would come and no out-lying

¹ Where two crosses are shown there was water on each side of a ridge of sand.

shoals could exist unseen that would be in any way a danger to the ships. In the photographs the ridges that are still covered can be distinctly traced by the water breaking on them. These must not be confused with the inshore edge of the sea-line on the coast.

It was further necessary to find out, if possible, the depth of the water between the ridges, especially those near the beach, as a foot of water makes a considerable difference to the rapidity of disembarking. It was therefore well to know whether the hollows were one, two, or more feet below the ridges. This was approximately ascertainable by measuring the water-line in the hollows, both on a rising and falling tide, and judging from these if the water had free ingress and drainage, or if it were imprisoned for any appreciable time. The mean heights gave approximately true water-line positions, and these, treated with common sense, gave the depth of the hollows between the ridges.

In Plate XLIX the sections at five points on the coast are shown. The positions marked "Fan," "2nd Maison Isolée," and "Hospital," were those at the places chosen for the main operation. The "Casino," "2nd Maison Isolée," and "Beau Terrain" were for use in the event of a more limited objective being decided on. The "Fan" was a peculiarly shaped earthwork close to Westende, the "Hospital" was just to the east of Middelkerke, and the "2nd Maison Isolée" about half-way between these two.

In order to check the accuracy of this method of shore survey, a careful survey was made of the beach to the east of Dunkirk by a surveying officer, and at the same time air photographs were taken. The first plotting showed greater discrepancies than I considered should exist, but a careful examination showed that the line of direction from the datum-point ashore along which the measurements from the photographs were taken differed about 10° in direction from that taken for the survey. When this was corrected the coincidence of the two was almost exact—a most reassuring result.

It was a good performance to deduce the slope of the beach to within an accuracy of six inches from photographs taken 14,000 feet up in the air.

The next problem was how slow vessels like the monitors in a strong tide, which set at its maximum strength along the shore at the time of high water, were to hit off the exact spots for landing—at all events, to within 100 yards—since, if more error than this were introduced, the contour of the beach might vary considerably in detail from that at the spot determined on. The Chief of the Staff at the Admiralty, Vice-Admiral Sir H. Oliver, had previously suggested a method in use by telegraph ships as an aid in our operations. This was known as the “taut-wire” method. A boat ran out a fine piano-wire with its end secured to an anchor dropped in a known position, and one turn was taken round a registering wheel. The number of yards run from the position of the anchor could be read off at any instant by a dial on the wheel.

This proved to be an extraordinarily accurate method when running dead up or down tide. In fact, distances were measured as with a tape measure. The method of its use in this case was simple. Two leading lights¹ were erected near Oost Dunkirk, which could be seen from the offing. One P-boat accompanied the leading monitor, dropped the anchored end of her wire about half a mile before the lights came in line, and took a reading when they did so. Observing the length of wire run off as shown by the registering wheel, she dropped acetylene-lighted buoys at predetermined distances for each monitor to turn on as she arrived opposite the turning position arranged for her. As a matter of fact, to avoid any chance of failure, two sets of leading lights were erected in case one went out, and the boats were always run in pairs. To check the position of the monitors on approaching the shore, this operation was again repeated by

¹ Leading lights are two lights one higher and behind the other. When the two are seen in line the observer knows he is on a definite line from them.

could they be carried on the pontoon ? and, secondly, could they climb the wall ? The first question was answered in the affirmative by Mr. Lillicrap, with certain reservations as to their position. I never had any doubt that we could solve the second problem, and we took the matter in hand. The slope of the wall was 30° and, as the tank got to the coping, the front part of the track would be obliged to take against it with practically a line contact. The coping would lift the tank bodily, and reduce the area of that part of the rear of the track in contact with the sloping wall, with the result that too little of the track would be in contact with the masonry, and the track would slip, and the tank would fail to climb. Also the greatest angle that the tank, with its more or less limited horse-power, would mount was 45° . The pull up over the coping would mean lifting its centre of gravity through 60° . It was necessary for the lift of the centre of gravity of the tank, never to exceed the slope of 45° in climbing. To ensure this the extra lift of the centre of gravity, to clear the vertical height of the coping above the sloping wall, should commence at least twelve feet from the base of the coping.

This obviously involved building a sloping way to be carried and placed in position by the tank itself to enable it to climb the coping. The top surface of the sloping way should not incline more than 10° with the slope of the wall.

On April 15th, 1917, I began work on the design of ways, and an exact replica of the sea-wall was built at the Tank headquarters in France. We made inclined ways at Dover, and sent them over on the 28th, and on the 30th had our first trials. The track had wooden treads fitted. These were hollow and crushed, so we altered them to solid slats. On May 1st the tank climbed the wall, and went over the top. But the slats were inconvenient, so we took other improvements in hand. On June 9th we had more satisfactory trials in France, so I turned all the gear over to the Tank Corps to improve it. On June 23rd I went to Birmingham with Sir T. d'Eyncourt and General Rawlinson to see the climbing arrangement that



TANKS CARRYING INCLINED-WAYS IN FRONT TO ENABLE THEM TO CLIMB
THE COPING OF THE MIDDELKERKE SEA-WALL.

Note the formidable overhang of the coping at the top of the wall at A in Fig. 2.

PLATE L.

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TANKS HAVING PLACED THE INCLINED-WAY IN POSITION CLIMBING THE REPLICA OF THE SEA-WALL AND PARAPET AT MIDDLEKERKE.

PLATE LI.

the Tank Corps in England had devised. The wall had no coping, and the wood-pad they used instead of inclined planes would not have been of use for the real wall. But the armour-plate spuds for the track were excellent. We arranged for the officers at Birmingham to go over to France, and work with the Tank Corps to evolve the best form of climbing gear, and arrange for fixing it in front of the tank. Plates L and LI [show the tank climbing in France on May 1st.

The time of landing was fixed at daylight, and the height of tide as not less than fourteen feet. Only about eight days each month fulfilled these two conditions ; but a close study of the beach at different states of the tide showed that a greater number of days per month could be used if the pontoons had a raft extension ahead of them. The reason was that, at lower tides, the pontoon landed its bottom on the first ridge from the shore, with its nose over the hollow between that ridge and the higher part of the beach. This meant about three feet of water for the men, tanks, and carts to dip into on their way ashore, whereas, if a raft could be provided, it would bridge across the hollow and land every one well on the beach. As an emergency expedient to extend the possible date of landing, the raft shown in Plate XLII was designed.

The raft was made of two layers of 4-inch timber, one laid longitudinally, the other transversely. All round the sides and in front were casks to give buoyancy, and a berthing was built three feet high, extending round the bow to about twenty feet aft on each side.

Of course no raft could of its own buoyancy float a tank ; it had, therefore, to be supported on the sand below. This I did by providing it with pillars of 1-foot square section ; these were baulks of wood with iron plates of 4 feet in area fitted to them as feet. These pillars could be dropped through tabernacles in the raft until their feet rested on the sand, and the pillar was then keyed by a pin through holes in the pillar and tabernacle. Support was thus obtained from these rows of

pillars fitted longitudinally along the raft, since the length of each pillar automatically suited the depth of water. The pin-holes in the tabernacle were 6 inches apart vertically, so that the feet could never be more than 6 inches from the sand, and therefore never more than 6-inch sag would be obtained on any part of the raft.

The rafts were pushed ahead of the pontoons safely at a speed of six knots, and were further tested by steaming a destroyer past them at full speed at two cables distant. The photograph in Plate XLII was taken during such a test, and the sinuous motion of the raft under the effect of the sea can be seen. But the trouble and failures we had before we got the rafts to push ahead of the pontoons would take half a chapter to describe.

Great doubts were expressed by authorities at the Admiralty as to the ability of the rafts and their feet to stand the weight of a tank; a raft was, therefore, sent over to the French coast between Dunkirk and Calais, and grounded under the same conditions as would have obtained on the Belgian coast, and a tank was made to climb on top. Not only did the raft support the tank under normal conditions, but even after the tide had fallen and left the raft standing clear of the water, the tank perambulated without the raft showing the slightest sign of strain or want of stability.

In the Swin the pontoons and rafts were moored about a mile from the ships so as not to appear to have any connection with them, and the joining up for practice was invariably done at night or in cloudy weather, in case enemy aeroplanes flew over. Stages and ladderways for conveniently running the troops from the ships on to the pontoons were built. The tops at the mast-heads of the monitors were fitted with smoke apparatus, and all possible preparations made.

Whenever the weather suited at night, the monitors joined up and manœuvred. The strictest observance of seclusion was enforced. If a man was dangerously ill, he went to the hospital ship. If anyone had died, he would have been

buried there. In the meantime a quarantine camp had been arranged half-way between Dunkirk and Calais in the sand-dunes at Le Clipon where the 1st Division took up their quarters under Major-General Strickland, and much the same regulations as regards communication were enforced as we had adopted in the Swin.

Complete unanimity existed between the Army and Navy, and the relations between Lieutenant-General Sir H. Rawlinson, Bt., commanding the 4th Army to which the 1st Division belonged, and Major-General Montgomery, his Chief-of-the-Staff, on the one hand, and ourselves on the other, were most cordial.

The broad scheme was to throw a party ashore at Middelkerke, another at Westende, and another half-way between, approximately each one mile apart.

The whole landing, it was estimated, would take only twenty minutes.

The *General Wolfe* and *General Crawfurd* took the Middelkerke landing;

The *Lord Clive* (Flag) and *Sir John Moore* the "2nd Maison Isolée" landing;

The *Prince Eugène* and *Prince Rupert* the Westende landing.

PROPOSED COMPOSITION OF THE LANDING FORCE

(I) PERSONNEL

Divisional Headquarters

- (a) G.O.C.'s party, about 19 officers, 40 other ranks.
- (b) Signalling party, about 1 officer, 15 other ranks.
- (c) Remainder, about 3 officers, 117 other ranks.

Total, about 23 officers, 172 other ranks.

(d) Left Column

2nd Inf. Bde. H.Q.
Comp. Batt. R.F.A.
Lowland Fd. Co.

(e) Centre Column

3rd Inf. Bde. H.Q.
Comp. Batt. R.F.A.
26th Fd. Co. R.E.

(f) Right Column

1st Inf. Bde. H.Q.
Comp. Batt. R.F.A.
23rd Fd. Co. R.E.

THE DOVER PATROL

(d) Left Column	(e) Centre Column	(f) Right Column
Det. A. T. Co., R.E.	Det. A. T., Co. R.E.	Det. A. T. Co. R.E.
2/R. Suss. R.	1/S. Wales Bord.	1/Black Watch.
1/North'n R.	1/Glouc. R.	1/Cam. Highrs.
1/N. Lan. R.	2/Welsh R.	10/Glouc. R.
2/K.R.R.C.	2/R. Muns. Fus.	8/R. Berks. R.
1 Co. 6/Welsh R.	1 Co. 8/Welsh R.	6/Welsh R. (less 2 Cos.)
13th Cyclist Bn.	17th Cyclist Bn. (less 1 Co.)	1 Co. 17th Cyclist Bn.
M.M.G. Batt.	M.M.G. Batt.	M.M.G. Batt.
No. 2 M.G. Co.	3rd M.G. Co.	1st M.G. Co.
126th M.G. Co.	Det., Tanks Corps	Det. Tanks Corps.
Det., Tanks Corps	3rd T.M. Batt.	1st T.M. Batt.
No. 2. T.M. Batt.	141st. Fd. Amb.	1st Fd. Amb.
No. 2 Fd. Amb.	Divnl. Sig.	Divnl. Sig.
Divnl. Sig.	Intell. Corps.	Intell. Corps.
Intell. Corps	Grenade Supply Co.	
<i>Total</i> , about 184 officers, 4,468 other ranks.	<i>Total</i> , about 175 officers, 4,258 other ranks.	<i>Total</i> , about 175 officers, 4,295 other ranks.

Grand Total, 557 officers, 13,193 other ranks, or 13,750 all ranks.

(2) TRANSPORT

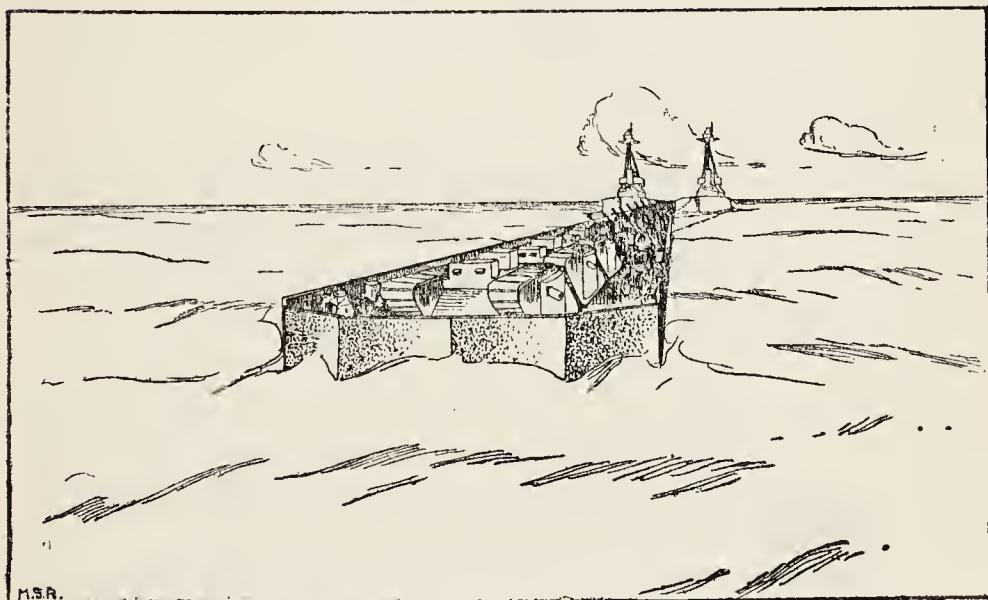
It was proposed to land the following transport for each column :

Tanks . .	2 male fighters, 1 female.
Artillery . .	4 13-pr. guns and limbers. 4 13-pr. wagons and limbers. 2 4·5-inch howitzers and limbers. 2 4·5-inch wagons and limbers.
M.M.G. Batt. .	19 side-cars. 8 motor-cycles.
Stokes carts .	8
Handcarts .	150.
Box-cars .	2.
Cycles .	Right column, about 3 motor, 183 pedal. Centre column, about 4 motor, 298 pedal. Left column, about 3 motor, 388 pedal.
Motor-car .	1 Sunbeam car with centre column.
Ambulances .	2.

The whole of the transport was packed on the pontoons, with a gangway left for the men to use in disembarking. See Plate XLIII.

The following is a description of the preliminary programme which, however, was not carried out :

In order as far as possible to avoid detection, the pontoons were kept in the Thames till the last moment, and arrangements were made for the monitors to tow them over to Dunkirk in the dark. As the distance was too great to traverse in one night, two consecutive nights had to be devoted to this. The first half of the trip was from the Swin to Trinity Bay in the Goodwin Sands, where buoys were laid down for



BIRD'S-EYE VIEW OF A PONTOON LOADED AND AT SEA.

the pontoons to lie at. If seen here, they would probably be mistaken for a portion of a defence for the Downs. Here the monitors left them and went to Dover to coal. The maximum of 100 tons only was to be taken in, so as to keep their draught as light as possible. The following evening they again picked up the pontoons and towed them to Dunkirk. On arrival in Dunkirk Roads, the tugs took the pontoons in tow and proceeded with them up harbour and moored them. After they were in position, the monitors entered and moored alongside them to hide them from view from the

town. Small craft also were used for this purpose where the water was too shallow for the monitors to lie. Air patrols were carried out both over the Downs and Dunkirk twice a day to prevent aerial photographs being taken.

The sea-plane base afforded a convenient loading-place for the pontoons. This was evacuated by the R.N.A.S., and the sheds were used to store some of the vehicles which were to be loaded on the pontoons. The others were parked in the vicinity. Two nights were devoted to loading the pontoons—one only was loaded the first night, as it was sure to be a slow operation to begin with. Two were to be loaded the second night. After loading, the pontoons were returned to their previous berths.

The following afternoon the troops were to be embarked. Early in the day the ships lashed alongside each other and rigged the stages and ladders for the men to disembark from the ships to the pontoons. An advanced party of twenty military officers and sixty men were to come on board early, the troops following at 4 p.m. From this time on a strong air patrol was to be kept up. The monitors were to leave for the roads as soon as loaded, and, immediately after, the pontoons were to go out in tow of the tugs, to be made fast to the buoys previously laid down one mile apart.

To avoid attracting attention by concentrating the eighty motor-launches—smoke-boats—too early in the day, the 1st flotilla was to assemble at Dunkirk the day before the actual start of the operations. The second flotilla was to assemble at Calais early in the day and sail for Dunkirk so as to arrive there at 7 p.m. The 3rd flotilla was timed to arrive at 7 p.m. from Dover and the 4th flotilla at 7.45 p.m. At one hour after sunset the motor-launches were to weigh and assemble opposite the monitors to which they were attached.

The destroyers available were all placed under the orders of Commodore Tyrwhitt in the offing, except the escort for the monitors and one flotilla-leader and six torpedo-boat

destroyers, four of which were French boats, as a guard for the monitors which were to bombard the batteries east of Ostend. Three units, each of three motor-barges, were loaded with stores and were to be grounded on the beach near each landing-place and left as a reserve for the troops to help themselves from the following night, if necessary. Intermediate between the monitors, and on their outer beams when steering for the shore, were small monitors, and between the small monitors and the 12-inch monitors were the smoke-making M.L.'s. Five minutes before grounding the small monitors were to open fire in order to deceive the enemy as to the exact position of the landings. Just before grounding the 12-inch monitors were to open fire with 12-inch and 6-inch guns, which had special charges so as not to injure by their blast the men and the pontoons.

The following is a description of the forecasted operation :

At dusk the monitors inside Dunkirk, with the troops on board, slipped and proceeded to the anchorage outside, and each monitor lashed to its twin-ship. The tugs took the pontoons in turn in tow, and towed them to the three buoys laid out each one mile apart—the *General Wolfe* buoy to the eastward, the *Prince Eugène* to the westward, and the *Lord Clive* in the centre. As soon as the nose of each pontoon was made fast, everything was ready for the tide to change to the westward. When this came, and the pontoons had swung, the monitors weighed, each pair moving up to its pontoon and dropping an anchor to steady the ships while getting in the chains. Each pair reported "ready" when secured, weighed anchor, and rode by the pontoon and the buoy to which the latter was made fast, and then waited. At 10 p.m. precisely the signal was made to slip and proceed, and each pair reported as they gathered way. The motor-launches closed and took up their positions on the starboard side of the monitors. An escort of destroyers formed on the port-bow of the *General Wolfe*, and two of the P-boats with taut-wire gear, one cable on the port beam. The Zuidcoote

leading lights were brought in line. The ships kept two points to starboard of their course on account of the tide, and the pass was navigated, the monitors turning under port helm into the West Deep and steering for the west end of the Nieuport shoal. One mile before the Oost Dunkirk leading lights were in line, the P-boats were told to drop the anchors for their wire, and, as the lights came in line, the executive signal told them to start the zero of their run.

Then, in subdued excitement, came a dead silence broken only by the lap of the water and the hum of the motor-boats. Cocoa was served out to the troops. At last a flashing buoy dropped from one P-boat and shortly afterwards from the other. These were for the rear-ship to turn on. A mile farther the same was repeated, and yet another mile the third pair were released. About two cables before reaching their respective buoys—that is, the mean position of the buoys dropped by that pair of P-boats—the starboard monitor was stopped, the helms of both monitors put hard a-port, and then the starboard monitor put half-speed astern—all this gradually in order to prevent undue strain on the chains of the pontoons. Three points from the course for the shore, the engine of the inside monitor was again put ahead, and the helm eased and the section, consisting of the two monitors and the attached pontoon, steadied on the new course, a point to starboard of their true course as the east-going tide was making.

About this time the bombardment of the forts east of Ostend by the *Soult* and of the Raverside batteries by the *Erebus* and *Terror* would have commenced. Star-shell were certain to be bursting well out at sea along the whole length of the coast and in the vicinity of the fleet. The smoke-screen was started and the whole fleet headed for the shore. Suddenly the light-buoys from the next pair of P-boats were seen close astern of the *Prince Eugène*, then a pair astern of the *Lord Clive*, then another astern of the *General Wolfe*. The course was corrected as necessary, and the next buoys watched for. The shore was now only a mile off. Half a mile from the

beach the *M.* monitors began to fire. At last eight-feet soundings with the bamboo-pole were reported ; both engines of the monitor were reversed, and the engines of the tanks started. Four feet ! two feet ! and then the pontoons gently grounded. The 12-inch and 6-inch guns of the monitors, with reduced charges at fixed elevation, roared out their hot bombardment.

One yell, and the first 400 troops burst ashore, the tanks began to move and almost at once reached the wall. Then a tense excitement : the tracks gripped, up the tanks climbed —the inclined planes were slipped. Yes, they were over ! A flood of troops swarmed the wall and the action began. As soon as the troops were clear, carts, gun-limiters, and sledges began to move off the pontoon, sailors and soldiers uniting in the work. The spare water-tins were dropped on to the sand. The steam-boats laid their cables, and soon telephonic communication with the three headquarters ashore was established. Soundings under the monitors were taken, and the telephone cables got ready for slipping. As soon as the tide began to fall appreciably, the monitors backed out well to the offing, followed by the motor-launches burning their stern burners. By this time shells from the Raversyde batteries were dropping among the boats. The monitors, when well clear, reversed their engines and turned once more for the West Deep.

Such is the description of what it was hoped would happen ; but, alas, it never came off !

While waiting for the advance to progress, I wrote, after careful thought and study, the following memorandum of the difficulties and chances of success of the operation.

“ I think it right to place on record clearly the reasons which induce me to recommend strongly the proposed landing operations.

“ Every scheme must be judged by its practicability ; but practicability has a variety of interpretations.

“ A scheme that is impracticable is of course useless.

" Total impracticability can usually be detected without difficulty.

" Doubtful success must be carefully considered.

" Success may be partial or complete. If the result aimed at is attained, even if the whole scheme initiated does not work out as originally intended, the scheme must be judged to have been successful.

" Again, losses must be balanced against the good attained. If the object in view is of great importance, losses may be of relatively small importance, or the converse may be the case.

" Again, when dealing with losses, the future must always be kept in view, and we must not forget that irreplaceable losses may affect adversely future operations to a degree that nullifies any present advantages that may be gained.

" Let me, therefore, formulate certain questions by which to judge of the whole matter.

" (1) Is the scheme impracticable ?

" (2) Is the object to be attained of great importance ?

" (3) Are the probable losses such as to make the scheme undesirable, especially from the point of view of possible future operations ?

" (4) Are the possible losses such as would affect the conduct of the war ?

" (5) Are the difficulties of carrying out the operations such as to make its success doubtful—that is, the tactical difficulties ?

" (6) What are the abilities and disabilities of the enemy in frustrating the operation ?

" The first question may be dismissed. There is no inherent impracticability in the scheme, no flaw which condemns it, and no gambling on the enemy doing the wrong thing at a critical moment.

" As regards (2) there can only be one answer. It is of almost vital importance for us to take the Belgian coast. Its retention after the war by the Germans would be a death-blow to Great Britain as a nation. During the war it is an ulcer to this country, not only as a naval, but also as an air base. It should have been taken long ago : it must be taken now.

" (3) and (4)—What are the forces implicated ? Six 12-inch

monitors and one division of troops. If the whole of these were lost it would most certainly be regrettable, but the future conduct of the war would not be vitally affected.

"At the present moment the 12-inch monitors are of but little fighting value on the coast. The range of their guns is hopelessly less than that of the large coast batteries. They are of use for the protection of the left flank of the army against a landing, but, now that we have sufficient troops on the coast, such a landing is most improbable. In no imaginable operations against German territory can these vessels be of any use. It is conceivable that, in case of a rupture with Holland, or an invasion of Dutch territory by the Germans, they might be of temporary value, but I can conceive of no other use to which they could be put.

"Hitherto I have carefully nursed them, as I have had no objective against which I could use them which was of a value comparable with their own. Their range was but little over half that of the shore batteries. I could not destroy water or breakwaters; no amount of bombarding by them could prevent Ostend or Bruges being used as submarine bases unless the locks were totally destroyed at Zeebrugge. This, with 12-inch monitors, was an impossibility. To attempt to knock out shore batteries of double their range, and one-thirteenth of their vulnerable size, was idiocy. But, when an object for their use of real importance arrives, the whole question is altered, and risks become imperative which heretofore were outside reasonable contemplation.

"(5) What are the tactical difficulties? So far as the monitors are concerned, these are nil. The smoke-boats introduce the only possible trouble; but, as these are divided into sub-divisions of not more than ten boats under a capable officer, and the M.L.'s are wedged in between the large and the small monitors, they have not got much scope for going wrong. This particular operation suffers from none of the troubles that are inherent in shore landings from boats where a large number of landing craft have to be used and synchronisation is necessary. Tactically, the mere operation of bringing the monitors in their right formation, with the smoke-boats between them, up to the landing-place is simple.

(6) What are the enemy's abilities and disabilities?

“ The enemy can disturb the operation in three ways :

“ (a) Attack by mobile light craft.

“ (b) Gun-fire both heavy and machine.

“ (c) Mines.

“ We should be able without doubt to cope with (a).

“ As regards heavy gun-fire, this without doubt is a serious matter.

“ There are a considerable number of guns, 6-inch and above, which can possibly be brought to bear on the landing, and, if it were openly carried out in full view of the shore, the whole scheme would be perfectly impossible.

“ The one thing which makes the thing possible, and on which all the success or failure hangs, is the smoke-screen.

“ It is easy, looking at a chart, to minimise the enemy's difficulties. Let us see what they are :

“ First, no knowledge of the whole scheme.

“ Second, no knowledge of approximate locality.

“ Third, no knowledge of exact locality.

“ Fourth, a dense fog hiding all movements.

“ Fifth, the disorganisation of communications inherent to a prolonged heavy bombardment.

“ Sixth, the loss of guns knocked out and personnel disabled.

“ Seventh, a most unholy strafe going on at all his guns.

“ Eighth, after information as to locality of the attack is received, the difficulty of knowing the distance off the shore, etc., at which to aim.

“ Ninth, no possibility of observing gun-fire.

“ Tenth, even if one landing position is located and strafed still two remain to carry out the scheme.

“ These are the difficulties as viewed from the shore—truly a formidable collection.

“ Even if the first and second were known to the enemy, there remain the exact localities which it is almost impossible for him to discover. *Speed of landing is the great element of success. It is, in fact, the whole underlying principle of the scheme to get men in numbers ashore before the enemy has time to appreciate the landing-points, and to have a sufficient number of landing-points to make a partial failure at one not of vital importance.*

“ The question of machine-guns is one for military experi-

ence to decide. The tanks are considered enough to deal with any concentration of machine-guns that is probable. Moreover, the smoke should make machine-gun shooting of problematic efficiency.

" Secrecy should hide the main principles of the operation.

" Smoke should screen up to the moment of disembarkation.

" Then the enemy has to appreciate the nature of the attack, and to meet it in a very short time in the midst of all the disturbing elements of a previous prolonged bombardment and an existing heavy artillery strafe.

" For a moment let us consider secrecy. To what extent is secrecy vital? If the exact details of the operation were known to the enemy, he could defeat it; but this would probably lead him to adopt defences which would largely indicate that he had discovered what we proposed.

" It is possible that he might try for the bigger game of inflicting severe losses on us, instead of merely defeating the operation; but if the danger of his position, should we succeed, be taken into account, and the fact that he can never know that at the last moment we will not change the exact points of landing, he is far more likely to go for the safer procedure of making the top of the wall impregnable.¹ At present there is reason to believe that he is more concerned about the coast from Blankenburgh to the Dutch frontier than any other part of the coast. If we could land in this neighbourhood and support the landing up to the point of Bruges being held, then with our Ypres army at Thourout, the retreat of every soul on the coast would be cut off, and a great disaster inevitable. Why should the enemy not forecast such an action on our part? It is not a bit more impossible than for him to land on the coast of England and support such a landing. Look at the serious attention paid to such a possibility on the part of the military authorities in England. Of the two, (1) the Germans landing and supporting a landing in England, and (2) we landing and supporting a landing at Zeebrugge, the latter is much the less difficult. The more, therefore, he is convinced of our landing, the more probable it is that his main attention will be concentrated on the east part of the coast.

¹ That precaution would have been visible in our aerial photographs.

"That he is assured that we will land need not therefore be a disadvantage.

"If he knows our scheme, he will show it by his defences.

"That he cannot know the exact places of landing is certain.

"Betrayal in secrecy should not lead to a disaster, since either it would make the attempt impossible if he really knew all, or it would concentrate his attention on harmless portions of the coast.

"We have the enormous advantage of *knowing what we are going to do, where we are going to do it, and when*. The enemy know nothing, at all events for certain, and therefore can only counter it at the last moment, or, if he does find out, he will show us he has done so.

"If he is fortunate to get on to one landing unit with what guns have survived the strafing, and we lose a couple of monitors, the loss is small in comparison with the object the others may attain. Now is the time to use these vessels when there is an objective of real value, and not necessarily to have them intact but rusty at the end of the war.

"Mines are of course a danger. High tide for the operations destroys the value of contact mines, and if observation mines¹ are employed, their number would have to be great to ensure getting two out of three of our landings. Even if the pontoons were damaged, this need not prevent the troops landing. This is one of those chances that cannot be accurately forecasted. But the chance of a single mine stopping a landing need not be looked on as very great.

"Nothing in war is a certainty. We in this instance have all the advantages of a new idea, and the initiative. We must not give the enemy credit for knowing all that we know, or endow him with the gift of prophecy. We must expect losses, but we have a big object in view. The scheme has been prepared with months of forethought and care, and there is good *prima facie* reason to suppose not only that it will be successful, but that it may be a very great success."

Now let us examine critically, in the light of subsequent experience, what were the chances of success. In the first place the enemy had no idea that the attempt would take

¹ An observation mine is one connected by an electric cable to the shore and fired when the observer sees a ship directly over it.

place; this was undoubtedly the case, as photographs of the sea-wall showed no sign that it was being defended. It was not till some time after the project had been abandoned, and the scheme was public property, that they put up obstructions against tanks. Without doubt our air patrol would have kept the enemy's photographic machines off Dunkirk, and, even if photographs had been taken, a plan view of the pontoons would have puzzled the enemy, as their connection with the monitors would not have been divulged.

The earliest information that anything was happening could only have reached the Germans when the leading monitors were off Nieuport—steering to the eastward. If a patrol had picked them up there, what information would it have conveyed? Very little. The more the monitors kept on the easterly course the more the conviction would have grown that Ostend or the eastward were to be the places of attack. There is no reason to suppose that the “turn together” towards the shore would have been observed. Even supposing it had been, what could have been done in one short half-hour, especially as the actual places of landing on the five-mile front, from Nieuport to Ostend would have been still unknown? With a frontal land attack in progress at Nieuport, the German reserves would have had a double rôle to play, namely, to reinforce the front line at the canal, and to defend the whole four miles of coast. It must be remembered that they would not have been able to draw troops from other points to the eastward, as guesses at our intention could at the best have been but surmise, and the east side of Ostend could not safely have been robbed of troops. The bombardment of Jacobenessen and Raversyde by the 15-inch monitors and 9·2 shore guns, and Tirpitz by our 12-inch shore guns, would have lent colour to a dash on Ostend. The dropping of smoke-buoys to the eastward of Ostend, which was extensively arranged for, could not have failed to draw attention by their lights flaming in the offing, whereas everything to the westward of Ostend would have been quiet except that ships were crawling to

the eastward. There was not the very smallest ghost of a chance that the enemy destroyers would have attacked the ships. The small monitor leading and our destroyers would have engaged them, and the enemy destroyers would have run away, as they invariably did, first perhaps firing their torpedoes at our destroyers.¹ The true spirit of offence whereby their destroyers should have gone right on through the screen was totally against the spirit of the German training.

Now the whole operation would have been enveloped in smoke, a dull red light showing, and this would have extended for three miles parallel to the shore and with the growing morning light have faded and given the impression of the attack passing away.

The next thing the enemy would have known was the phosphorus smoke, which they well might have interpreted as poison gas. This would have meant putting on gas-masks, and within a few minutes a burst of firing from the small monitors would have at last awakened them thoroughly to the fact that the portion of the coast to the westward of Ostend was the subject of attack. But here again, if any attempt at concentration on the points fired at had been made, the enemy would have been "sold," as the small monitors were each half a mile from the real points of attack. So that it was not till the pontoons grounded in the impenetrable mist of smoke, and the 12-inch and 6-inch guns of the monitors crashed forth at point-blank range that the true positions would have been revealed. For five minutes the guns would have thundered, during which time the tanks would have moved forward with the first attacking party, and then firing would have ceased just as the tanks were timed to top the wall.

The whole operation would have been simplicity itself from our point of view and shrouded in impenetrable mystery from the enemy. The audacity of attacking the sea-wall would never have occurred to them, because they would never have thought of the smoke-screen. The subsequent success at

¹ The speed of our destroyers was strictly limited to eighteen knots to avoid wash, see page 104.

SHOWING WESTENDE BEFORE THE INTENSIVE BOMBARDMENT BY OUR TROOPS IN 1917.



PLATE LIV.

SHOWING WESTENDE AFTER THE INTENSIVE BOMBARDMENT BY OUR TROOPS IN 1917.

The peculiar shaped earthwork at A is visible in each picture, but the bombardment has obliterated nearly every other prominent mark.



Zeebrugge was a guarantee that the attack would have been a surprise and a success.¹

A phosphorus smoke-screen is dense near the burners, and floats away in about 5° cones. Eighty boats with three burners each were to be used on a front of three miles. Fifty tons of phosphorus would have been burned. The cumulative effect, owing to the length of the stream of smoke when looking towards the burners, is great and the smoke is absolutely impervious to vision, but when in the screen, even twenty yards from the burners, objects close by, say ten yards off, can be distinctly seen. So that although the smoke would have hidden the approach of the flotilla, it would not have seriously incommoded the troops when once ashore. To add to the efficiency of the screen, burners were established at the ends of the pontoons for use during approach, but they would have been dowsed after grounding. Large burners also were fitted at the mastheads of the monitors to hide any view of their masts. The effect of searchlights thrown on the screen is to reflect light and render it even more impossible for faint objects to be seen through it.

A bucket of water instantaneously extinguishes the phosphorus, and stops all smoke.

Now, as regards heavy gun-fire, the chief batteries to be feared were the 6-inch batteries at Raversyde; but what were they going to aim at? Nothing would have been visible through the smoke, and naturally, knowing nothing about the pontoons and monitors, they would not have known the distance from the wall out to sea at which to aim, or the exact position longitudinally along the coast. The very strong air patrol would have interfered with spotting by the enemy machines after daylight. The 15-inch monitors and the 12-inch and 9·2-inch guns we had previously landed would also have largely paralysed these batteries. Even if the Germans had known of the landing, it would have been most difficult

¹ A subsequent examination of the sea-wall showed that it was less formidable than the one we had built in France for our experiments.

for them to frustrate it without raising a parapet to the sea-wall, especially as the points of landing were in practice certain to be somewhat displaced from the exact points selected.

From the naval side of the operation, every condition argued success. The military authorities of the 1st Division were confident, viewing the project from their standpoint. A sea-wall had been built in the isolation camp, and the men practised in scaling it. A model of the whole length of the coast, about 100 feet long, had been made, and the marks and houses at the different points studied.

Plate LII shows the proposed progress ashore, the original jumps, and the areas of the subsequent push. It will be seen that the distance between the Westende landing and the British lines was a bare mile and a half, with all the chief batteries taken in rear. The other landings were behind the second line of defence. So far as could be foreseen, the frontal attack, combined with the surprise attack in the rear, would have resulted in the Germans being surrounded; they would have been completely overwhelmed. The landings for this operation are shown as being at the "Hospital," the "2nd Maison Isolée," and Westende "Casino."

Another scheme was also prepared in which the original was modified so as to be merely a jump to destroy the guns and hold Westende without a further advance along the coast being meditated. The landings in this case were to be at "Beau Terrain," "2nd Maison Isolée," and the "Fan," a peculiar earthwork at the extreme west end of the sea-wall.

The plans unfortunately were never put into operation. July and August passed, and our troops were still held up on the Passchendaele Ridge. The advance of the troops never reached Roulers. All July and August we eagerly waited an increased rate of advance, but the weather was against the expected progress. The tides in September suited, but the mornings were closing in, and, as the time of landing had to be about high water, it became evident that, if it was to

come off in October, it would have to be before dawn ; but hitherto the army had desired daylight for the attack.

A conference was therefore held at G.H.Q., at which I urged that, in default of the Army reaching Roulers, we should carry out a modified operation—seize the coast merely from Middelkerke to Nieuport, destroy the one hundred odd guns installed in that corner, and give the Navy a chance of landing heavy guns at the Palace Hotel to reach the Zeebrugge lock and Bruges dock. Of this, however, the Commander-in-Chief did not approve.

But, as General Sir H. Rawlinson was quite prepared to carry out the main operation before dawn if there was good moonlight, the Commander-in-Chief approved of this being done. Everything was, therefore, kept ready for the project all through September and half of October. The only difference it made to us was that the glare of the phosphorus-burners would be apparent ; but this, extending over a length of three miles, did not worry me. After the enemy had appreciated that the glare was approaching, it would have been impossible for him, in the twenty minutes only that would elapse up to the time of landing, to take any active measures to forestall the attack.

One kindly act on the part of General Strickland and his officers was to invite the interned monitors' crews to visit the camp of the 1st Division interned at Le Clipon. This proved a very welcome change from life shut up in the Swin. The monitors went over in pairs and anchored off Le Clipon, and the men had three days ashore. Visits under good surveillance were arranged to the Front, and the officers and men thoroughly enjoyed their visit.

On October 15th the 1st Division was ordered to move from the coast, and the operations were abandoned for that year. Disappointment and gloom settled for the time on us all !

THE DREAM

Slowly move the ships in darkness piercing through the inky night—
Monitors lashed close together, pontoons reaching out of sight.
Eighteen thousand men assembled, chafing at the progress slow,
Wait the aim of their ambition, wait the time to strike the blow.
Breezes soft blow warm, for summer with its heat has scarcely gone ;
These will bear our shelt’ring smoke-cloud, and blot out the fleet at morn.
Light-buoys gleam and mark the turnings for our passage to the beach—
Ships now swing and head the pontoons for the points they hope to reach.
Roar of guns at shattered Nieuport, Westende batteries reply.
See the shore attack in progress lights with glare the neighbouring sky.
Star-shells burst and light our vessels with the brilliance of their rays,
But our smoke spreads sweeping shorewards an impenetrable haze.
Dawn now tints the former darkness ; blackness changed to ashy grey,
Marks the near approaching advent of that long-awaited day.
Bursts of firing from the smaller monitors on either beam,
Shells from batteries soon answer, heralded by vicious scream ;
Then our twelve-inch join the clamour, hurling death at point-blank range.
Each man grips his rifle firmly, final whispers interchange.
Tanks are throbbing, engines warming, ready for that classic climb—
Minutes never passed so slowly ; seconds seem long hours of time.
Then at last faint shock and grating, one great rush, and one great cheer,
As the tanks and living columns in the smoke-cloud disappear.
But that shout our dream has ended ; broken is our reverie—
Wake to find that we’ve been dreaming of what never now can be.
Cruel fortune rudely shattered that matured and cherished scheme—
All that might have been has faded. Nothing left us but a dream !

CHAPTER X

PLANS FOR BLOCKING ZEEBRUGGE AND OSTEND

An attack on Zeebrugge planned in 1915—Reasons for abandonment—Plan for blocking Ostend—Reason of postponement—Considerations bearing on a successful blocking operation—Impossibility of imprisoning submarines and destroyers—Objection of the Army to the blocking scheme—Planning an attack on Zeebrugge Mole—Scheme approved by Sir John Jellicoe—Plans prepared—General description of operation—Criticism of operation as eventually carried out—The Operation Committee's plan for blocking—Question of tide—My supersession in the Dover Command;

IN 1915 I worked out a scheme to destroy the lock-gates and attack the Mole at Zeebrugge. The Mole in those days had little on it to destroy, but its capture was a stepping-stone to the attack on the lock-gates. This scheme was thoroughly discussed with the First Sea Lord, Sir Henry Jackson, with the Chief of the Staff, Sir Henry Oliver, and with Admiral of the Fleet Sir A. Wilson, and was abandoned chiefly on account of the difficulty of getting a good smoke-screen.

The method of obtaining smoke in those days was by using ammonia and SO₂ (sulphurous anhydride) gas. Twenty trawlers were fitted out with the apparatus and trials were carried out in the Thames. It is true a smoke-screen was produced, but it was too localised and not sufficiently persistent on a dry day to be efficient; moreover, great trouble from corrosion of the nozzles of the jets was experienced during a reasonably prolonged operation. Such a difficulty could have been overcome, but the main defect of want of persistence of the smoke was fundamental. The attempt was, therefore, postponed till a more efficient screen could be produced. It

is interesting, however, to examine the proposal to show how experience led me subsequently, in 1917, to alter the original dispositions.

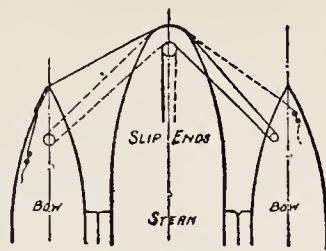
In broad outline, the advance was to be behind a smoke-screen with the wind from a suitable direction. The force selected consisted of three 12-inch monitors, four 9·2-inch monitors, two gunboats, four destroyers, fourteen trawlers, with smoke, and ten trawlers with marines for a landing party. The first phase was to go for the Mole batteries with the 12-inch and 9·2-inch monitors and land the men from the trawlers on the inside of the Mole, destroying the vessels alongside and the dredgers. The smoke-screen was to be brought round the end of the breakwater and extended again to the westward on the inside. After this screen was in place, two 9·2-inch monitors and ten trawlers were to break through the smoke and enter the canal to destroy the lock-gates. The operation was to be a daylight one.

The proposal was thoroughly discussed. The landing at the lock-gates was considered too hazardous, in view of the enemy's machine-gun fire and his local troops, to warrant that part of the scheme. To work with a thin smoke-screen and pass it round the Mole end under fire was rightly considered a difficult operation with trawlers. There was insufficient objective to make a mere raid on the Mole worth the risk. The alternative of firing at the lock-gates with the 9·2-inch monitors from the entrance of the canal was discarded on account of the proximity to the shore batteries, and the impossibility of relying on the smoke-screen to cover the flank of the vessels, if close inshore. Firing a torpedo up the canal was almost impossible owing to the shallow water, and its probable erratic depth-taking on discharge. The operation was consequently postponed till a reliable smoke-screen could be worked out.

At the same time—that is, in 1915—I evolved a scheme for blocking Ostend, and two old merchant steamers and the obsolete cruiser *Apollo* were allocated for the work. A single merchant ship was too short of itself to block the channel.

SHOWING ARRANGEMENT OF
TOWING HAWRSERS, SHIPS
BEING SECURED ALONGSIDE

APOLLO



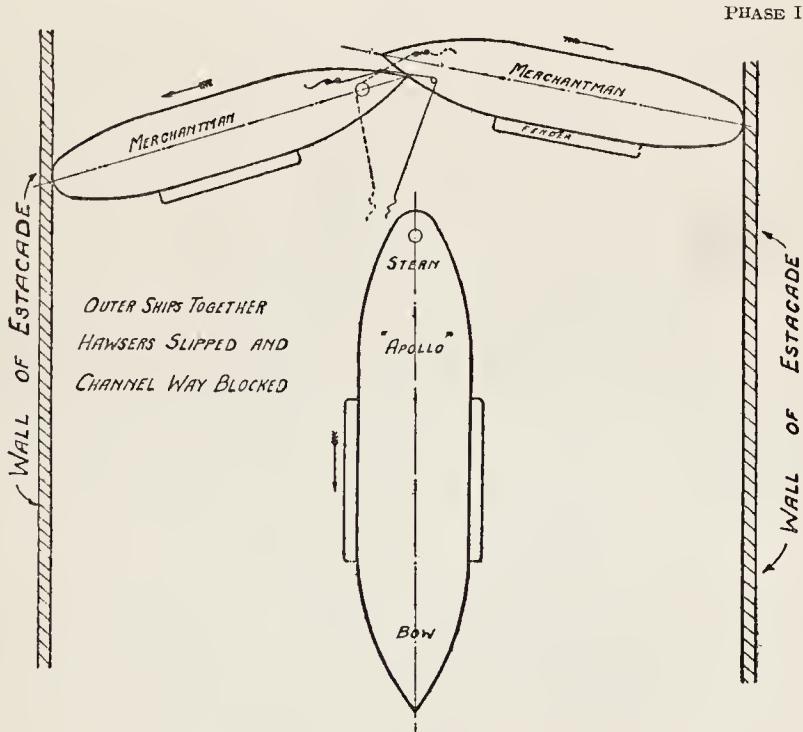
PHASE I

OUTER SHIPS SWINGING TOGETHER

SLIP ENDS
STERN

PHASE II

SLIP ENDS
STERN



It was, therefore, necessary to use two ships in order to stretch right across. The problem was how to get these two ships to overlap. The idea I worked out was to put the two steamers one each side of the *Apollo*, with their bows towards her stern. The bows of the steamers had hawsers rove to one another and on to the *Apollo*. The *Apollo* was to steam *stern* first, with the merchant vessels steaming ahead alongside her, from the Thames to Ostend, and into the channel between the piers (Phase I). The ropes securing the sterns of the steamers to the *Apollo*'s bow and the springs were then slipped, the helms of the merchant steamers put hard over outward (Phase II), the blowing-up charges fired, and the *Apollo* steaming ahead, the hawsers to the bows being kept fast in the *Apollo*, would draw the bows of the two blocking ships together, the sterns would swing outward and ground on the sides of the channel (Phase III). This action would have forced their sterns well on to the mud at the sides of the channel, and locked their bows. The *Apollo* would then part or slip the hawsers and steam out to sea. The ships were prepared and the arrangements tried in the Swin at the entrance to the Thames; but, when near completion, the proposals for landing troops in Ostend led to the postponement of the operation. Plate LVI shows the *Apollo* with the merchant ships alongside.

In all our operations on the coast, the Navy was really an auxiliary to the Army, and no important operation was undertaken without the concurrence of the Commander-in-Chief of the British Expeditionary Force. The reason was obvious. The Navy never could, of itself, take the Belgian coast. The Army only could do that. The taking of the coast was of the most vital moment to the country, for reasons that have already been explained. We incessantly urged operations to eject the enemy from Belgium, and all our operations were conducted to aid that end and not to handicap it. But the Commander-in-Chief of the Army in France was anxious, in any advance in Belgium, to use Ostend and Zeebrugge as sea-



"APOLLO" AND BLOCKING SHIPS LASHED ALONGSIDE AS PROPOSED FOR
BLOCKING OSTEND.



"CAPTURED BY CAVALRY."
German submarine stranded near Grisnez.



THE BLOCKADE OF ENGLAND !!
Merchant traffic in the Channel, 1916.



A MERCHANT SHIP SINKING AFTER BEING MINED.
PLATE LIX.

bases, and was averse from any operations which would prevent the ports being available ; unless, therefore, really permanent benefit could be derived from blocking Ostend and Zeebrugge, the requirements of the Army obviously governed the consideration of any such operation.

Blocking harbours with ships requires most careful study in order to be successful. Merely to dump a ship down, is absolutely useless. If a harbour is to be blocked, no exit must be left for the craft against which the blocking is directed. It may be accepted as a maxim that if the draught of the vessels which it is intended to shut in does not materially exceed the rise and fall of the tide the blocking operation must be ineffective.

To block a harbour against large vessels—that is, to deny the use of the fairway for the passage of large ships—is comparatively easy if the channel is narrow and not too deep, like the harbour entrances on the northern French and Flanders coasts. In face of a determined and resourceful enemy, it is, however, a practical impossibility to block such a harbour for more than a few days, so as to make it useless for small vessels of a draught similar to that of submarines and destroyers. The reason is a simple one. Large vessels, when navigating in and out of these harbours, occupy a considerable portion of the fairway both as regards breadth and depth. After reasonably skilful blocking, no room should exist for a large vessel to pass round the extremities of sunken ships, and, in order to pass deep-draught ships in and out, the whole of the centre of the blocking ship must be removed down to the bottom of the channel. This, in reality, means lifting the ship—a long, difficult, and tedious operation.

To remove a ship piece-meal necessitates under-water diving operations, which in a tide-way are bound to be lengthy. To scatter a ship with explosives is worse than useless, as the torn ribs and plates leave snags dangerous to navigation, and a tangle of metal very difficult to remove.

If, however, it is merely desired to pass out vessels with small

beam and with 14 feet or so draught—with a rise and fall of tide of 14 feet—then, if the portions of the ship above low water are removed, the craft can steam out at high tide, or, in the localities under discussion, for one hour each side of high water.

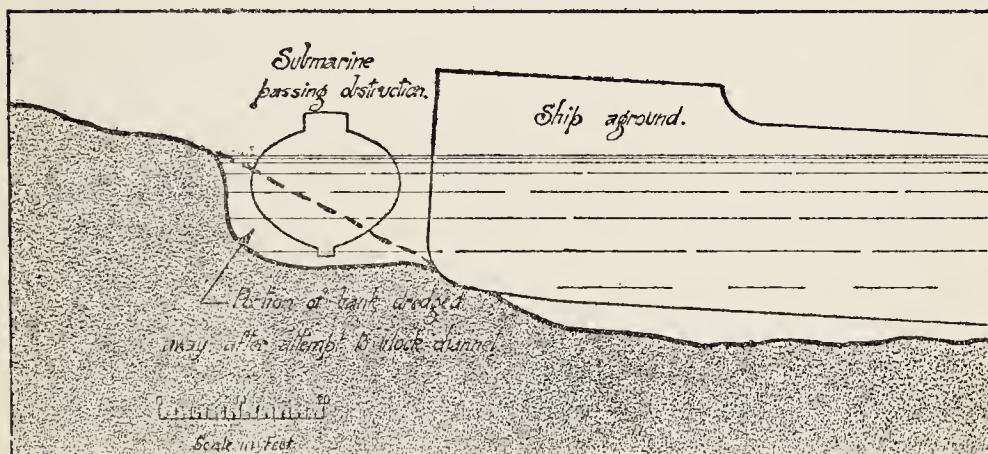
To the Germans, such restricted ingress and exit mattered little, since they never had reason to send boats in or out in a hurry, though, of course, such an obstacle would have been inconvenient. They never rushed out their destroyers to attack ours in daylight, and their coast batteries ensured leisurely entrance to their harbours. For pre-arranged raids their destroyers could be passed out on the high water before the raid, as was the usual practice with the boats issuing from Bruges, and their submarines also could leave at definite hours each day. Rapid passage at all times of the tide was of no account either to their destroyers or their submarines.

It will, on consideration, be also appreciated that in order to block a harbour against submarines and destroyers, there should be insufficient mud ahead or astern of the blocking ship, when sunk, to permit a passage being dredged, this being the simplest way of making an exit. But blocking ships, as a rule, draw at least 16 feet of water, so that where the stern grounds, there will be about this depth of water and, unless the bank is almost "steep to," very little dredging will be required to make a channel for submarines and destroyers to use at high water.¹ (See opposite page.) If no such channel can be dredged, a passage can be cut through that portion of the ship which is above water at low tide. The following figures give a rough estimate of the time and work involved.

Take the cutting of a channel 48 feet wide through a ship of 60 feet beam with three decks, and with the hull 12 feet above high water, to be cut down 14 feet to the low-water level. The plates should be cut into pieces of 12 feet by 12 feet superficial

¹ At Zeebrugge, when blocked in 1918, the stern of the important blocking ship was close to a pile jetty, the removal of which and the opening up of the Channel to destroyer traffic was a most simple engineering operation.

area, and, when cut, lifted with derricks and either taken away in lighters, or landed on the parts of the ship that are to remain. The total number of linear feet to be cut with oxy-acetylene blow-pipes would be about 3,000. Assume each burner under the best conditions will cut mere plating at the rate of 100 feet per hour, and, taking angles into account, call this 30 feet per hour—a very moderate estimate. One hundred hours would be required with one burner, or, say, ten hours with ten burners, to cut the required gap. Now



for contingencies and delays—waiting for tide, removing concrete, etc.—call the ten hours ten days—that is, multiply the time by twenty-four, which should be an ample margin. It becomes apparent what a comparatively simple job it is. With the large fall in tide, all the work can be done above water. Much concrete cannot be carried high up in the ships on account of stability, since, if weights are carried high up, they must also be carried low down, and, if both high up to make the blocking more secure, and low down to give stability, the total draught of water is increased and the passage round the ends similarly enlarged. Even so, concrete is by no means difficult to remove when working above water. If, after this work has been completed, it is desired to cut

down a little below low water-mark, the sides can be blown out with small local charges of high explosive, which, if judiciously placed, will bend the plates outward, and cut through the beams without scattering the wreckage broadcast, and causing dangerous snags below water.

Now Ostend and Zeebrugge were used very little by enemy merchant ships. Occasionally one slipped round the coast, but this was rare. So that to block either of these ports with block-ships meant that it would be blocked for four or six months against large ships, *which the enemy did not want to pass*, but which we ourselves confidently hoped to pass during an advance in Belgium. At the same time a channel could be cleared by the enemy in ten days or a fortnight to allow destroyers and submarines to pass—*the very vessels we should have liked to block in*. I always hoped that before the enemy evacuated either Ostend or Zeebrugge, a joint local attack by the Army and Navy might seize the harbours and prevent the enemy closing them by blocking or local damage. Faced by these hard facts, in association with the point of view of the Army and a prospective advance on the coast early in 1916, entailing use of these harbours, there was no option but to abandon the operation, which would have been a neat and probably a successful one.

It may be asked, with some reason, why, if blocking was so undesirable, did we bombard the lock-gates at Zeebrugge. The answer is simple. If a lock-gate were hit when shut, the chances were; the canal would be efficiently blocked for some weeks, as a caisson must be dead true to slide in and out of its housing position. It was, however, not so long a job to repair the caisson as to remove a blocking ship, especially as we had the exact plans, and, in case of necessity, could have built a new one in England. Damage to the caisson blocked the canal efficiently against small craft for some weeks ; blocking ships did not do so. At the same time, when the coast landing was imminent, and the advance to Roulers in train, I fired on Ostend dockyard rather than Zeebrugge, since it

was not the moment to do deliberate and extensive damage to the locks—supposing that we had succeeded. On the other hand, the destruction of the workshops at Ostend in some degree assisted the advance by delaying urgent mechanical repairs.

The advance on the coast in the spring of 1916 never took place. The attack, by the Army in the first instance, occurred farther south, but it was arranged that if good progress were not made in the southern area, the plan of an attack on the coast would be revived. The harbours, therefore, were kept open during 1916.

A proposal from Commodore Tyrwhitt was carefully considered by Sir John Jellicoe, Sir H. Oliver, the Commodore, and myself in December 1916. It consisted of a surprise attack on the lock-gate, but I was not in favour of the particular scheme proposed, and was strongly averse to the operation being carried out at that time; as we were then on the eve of the proposed advance on the Belgian coast, and of the Great Landing, the necessity of keeping the harbours unblocked was paramount; and, further, the larger scheme of landing rendered the use of our most efficient smoke-screen (which so far had not been divulged to the enemy) most inadvisable, as it would have called his attention to the unprotected state of his coast under such a method of attack, and hazarded the success of the far more important operation.

Considerable preparations were being made for the coast advance in 1917, and no inshore operation could be considered till after the failure to reach Roulers in October, and then the advance was merely postponed till 1918. In November, however, the disintegration of Russia pointed conclusively to the improbability of an advance in 1918, and the probability that the initiative in attack would pass to Germany. The landing on the coast of a considerable military force (for there were no troops to spare) was, therefore, definitely abandoned, which was a great disappointment to every one.

Officers and men who had been interned up the Thames on the tip-toe of expectation, naturally felt the reaction.

I therefore considered it highly desirable to have some operation to compensate them for the one which had missed fire. Being free to turn my attention to smaller operations, since there was no longer any objection to our using our smoke-screen inshore, as no other scheme would be prejudiced by our giving away our ability to creep close in without being accurately observed, my mind reverted to the attack on the Mole and lock-gates at Zeebrugge, originally planned in 1915; and I approached the subject of an attack with the experience of two years of operations behind me.

The use of motor-launches and phosphorus, or other methods of making smoke, made an attack on the Mole possible in 1917. The main modification that experience led me to make was to land on the *outside* of the Mole instead of the obvious *inside*, as the former seemed almost an impossibility, and therefore a landing would be less expected from this quarter. The "impossible" is generally easy, if only sufficient time and thought are available to study the difficulties of the operation. A section of the Mole wall is given in Plate LVII. The outside of the Mole was a vertical wall 27 feet high. Inside its top was a parapet about 4 feet high, with a walk running the whole length. On the inside of this parapet was a sheer 14-feet drop on to the main Mole with only very occasional vertical iron ladders leading down, so that four difficulties were at once apparent: the first to place the ship with the landing party in close contact with the Mole; secondly, to get the men up the 27-foot wall; thirdly, to get them down on to the Mole; and, fourthly, on retirement, to enable them to climb the 14-foot parapet. Plate LVII shows how it was proposed to do this by bringing a monitor bow—on to the Mole. It was useless to bring a ship alongside broadside on. It is not too easy to berth a ship quickly alongside a wall in a 3-knot tide, even with a party

of men ashore to help.¹ The Germans obviously would not make fast her ropes, and again the swell which was always certain to exist alongside would bring an unfair strain on the brow. I devised, therefore, the following plan. A permanent landing brow, 80 feet long by 10 feet wide and hinged at a point 34 feet from the inboard end and 46 feet from the other end, was to be built on to the forecastle of the monitor on a turn-table. This brow normally was to be carried topped up in one straight line, and supported by a number of topping-lifts,² the multiplication of the topping-lifts being necessary in case one or more were destroyed by gun-fire. When the monitor's bow came against the wall, the outer topping-lifts were to be eased down, and the landing brow hinging in the middle, allowed the shore end to rest on the breakwater. A complete switchback was thus provided for the men to run out of the monitor up a 30° slope and down a 40° stepped slope on to the breakwater. Having satisfied myself that the weights were not excessive, and that the general idea was feasible, details were considered.

The first and foremost was how to get a monitor into this position. The obvious way was to ram the Mole, but, as this might lead to stopping the engines too soon and so getting bad contact, or stopping them too late and so damaging the brow and risking the success of the attempt, I decided to build a 20-foot false bow of wood and steel on to the monitor, which would crush and act like a huge fender; but it was essential to construct it to crush downwards, and not upwards, as otherwise it would jamb the brow. A bower-anchor would hold up the bow against the tide, which would be setting strongly to the eastward, and a seven-ton anchor with two shackles of very heavy chain, tailed with ordinary bower-cable,

¹ The method of so doing devised for the Ostend operation could not be used, as there were no bollards available. See page 220.

² A topping-lift is a rope from a mast to support or lift the end of a spar or platform rigged out at an angle to the mast.

would hold the stern.¹ If the bow held where it struck the Mole and the whole of the two shackles were out with the stern anchor, the ship would only swing 30° from the perpendicular to the wall; this would be amply allowed for by the movement afforded by the turn-table, which was constructed to allow of the ship taking an angle of 70° with the brow.

The objects in bringing the ship in "bow-on" as before mentioned were twofold—one, to ensure good contact at once, and, the other, to keep the ship end-on to any lop there might be, or to the destroyer wash, which experience had taught us was always set up and persisted for a distance of some miles from where these vessels were steaming. This has been referred to in discussing the Ostend bombardment and the proposed landing on the coast.²

The main essential was to land the men on the Mole in the *quickest time possible*. In an operation of this nature, 900 men if landed at once meant far fewer casualties than if driblets were thrown ashore. Everything, therefore, depended absolutely on rapid landing and diverting the attention of the enemy away from the Mole. This led to deep consideration as to whether the Mole landing should be the first part of the programme, or whether a preliminary bombardment of the Knocke batteries should be undertaken, and whether the airmen should bomb the Mole. The main essential was that the landing should be rapidly carried out before any idea of the Mole being the objective could arise in the mind of the German officer responsible for defence. It was inconceivable that the approach of vessels would not become known ashore when they arrived within three miles of the coast. Surmise as to our objective would therefore arise somewhere about twenty minutes before contact with the Mole was effected. It was better to satisfy this surmise by

¹ These sizes were far larger than necessary; but it was just as well to be on the safe side, as no inconvenience was caused.

² See page 104.

a bombardment than to leave our objective open to conjecture. A bombardment of the Knocke batteries for a quarter of an hour before the attack would, therefore, assist rather than prejudice the Mole landing.

As to an air raid, bombing the Mole might drive the crews of the destroyers for shelter into the low-level landing-places of the Mole, but it might also cause the boats to shove off, so I decided against bombing the Mole, and in favour of merely bombing the lock-gates as an auxiliary rough mark to assist in fixing the position of our ships.

The first stage was therefore a bombardment of the Knocke batteries to foster an idea that a landing on that part of the coast was intended. The Germans were always very touchy about that portion of the foreshore, since if a successful landing did take place and Bruges were to be reached, the main line of retreat from the coast would have been cut. Such a landing was really quite impossible owing to the nature of the ground, and the sea communication that subsequently would have to be kept up. However, this part of the coast was chosen for bombardment to attract attention.

A quarter of an hour after the start of the bombardment the monitor would reach the Mole, letting go her stern-anchor just before ramming, and dropping her bower-anchor. The brow would be lowered at once, and the landing-party rush ashore, dividing into three parties each of 300 men. The impetus of the men down the 40° slope would have been an asset in launching the attack. The first party was to go straight across and seize and sink with bombs the destroyers if they were still alongside the Mole; the second to turn left and take the guns at the end of the Mole; and the third to throw a defensive line across the breakwater from just beyond the coal-heap to the parapet, holding the sheds, and taking with them half-filled sandbags for a temporary shelter.

It was important that the monitor should not, if it could be prevented, come under fire from the Mole guns and the batteries to the westward of the root of the Mole. Smoke

was the great security against this, but to aid this end further a destroyer division was told off to engage the Mole battery, if it was visible through the smoke. The tendency always is for human beings to shoot at the force shooting at them, unless specially warned not to do so; it was highly improbable that the high command at Zeebrugge would have any inkling of the attack by monitors, and therefore it might confidently be assumed that no specific orders of this nature would be issued. If the monitors were observed steering into the breakwater, and they did not fire at the battery, they would probably in turn not be fired at in preference to the destroyers who were engaging the battery, as it would look as if the monitors had mistaken the entrance and would be wrecked on the Mole.

Another main feature of the operation was to fire at the lock-gates at short range. The Mole was only one mile from the gates. At such a range with 12-inch guns, it was almost impossible to miss them, even at night. As the angle of descent of the projectile was only 4°, the danger space afforded to a vertical target was very great. I therefore arranged for a second monitor to go alongside, parallel to the Mole, broadside on at a point shown G.C. in Plate LVIII, while the other rammed the Mole at J.M.—G.C. signifies *General Craufurd*, and J.M. *John Moore*, the two selected for the work. I did not wish to risk the loss of the 15-inch monitors, although such risk was slight, and the other three 12-inch monitors were reserved for a special purpose in another proposed operation.¹ The *John Moore* was to carry the Admiral's flag, as I considered it highly desirable to be at the central position of the attack.

There was no objection to taking the *General Craufurd* broadside on since she would not have been required to make fast to the breakwater—it would have shielded her from the shore batteries and given her a position to lie at of known range from the lock-gates, and probably her close

¹ These were being fitted with 18-inch guns for bombarding Bruges.

proximity to the Mole would have caused the tide to steady her and keep her fore-and-aft line in a constant direction; this was an important point, as, owing to the smoke-screen, it might have been difficult for her director officer to see the aiming mark out at sea. She would have had no men to land and no physical connection with the Mole, and, by being broadside on, would have ridden comfortably by her bower-anchor and without a stern-anchor. It would not have mattered if she rolled a little, as her function was to fire her 12-inch guns at the lock-gates; nor would there have been any need for her to make fast to the Mole, as she would only have had to get near enough to identify her position from her director tower. She would have had no brows nor any connection with the shore, and, if she had not hit off her exact position at the Mole, she could have moved along the Mole till she was in her right place. Her line of direction of fire would have been of some importance, so as to get the two lock-gates in line; by so doing an "over" from the near lock-gate would have stood a chance of hitting the farther one. One advantage of using two ships also would have been that, in the event of the monitors being fired at, the fire would have been divided between two ships instead of being concentrated on one ship.

To facilitate fixing the exact position of the firing ship so as to avoid delay, a plan of the breakwater was prepared with every twenty yards marked and fixed from prominent existing features, and the ranges and bearings of the lock-gates were calculated and tabulated from each of these 20-yard positions. The least elevation to clear the parapet with the projectile was 3° , so that 5° was selected as the least that could be safely used. The distance of the gates was exactly 2,000 yards— 5° elevation with a half charge gave too long a range, so that special charges were ordered to give 2,000 yards range at exactly 5° elevation. For a similar reason special charges were ordered for the 6-inch

guns to range the sea-plane sheds and barracks to keep a continuous fire of high explosive shells on this portion of the Mole. See plate LVIII.

It was easy to take a monitor nearly alongside and keep her there in the tide, but not so easy to ensure getting her off with a wind blowing on to the Mole. One destroyer, therefore, was detailed to come in under the lee of the monitors and anchor off the stern of the *General Craufurd*, and at once to run out a 4-inch wire hawser to tow her bow off,¹ when the time arrived for her to leave.

This scheme was submitted to the First Sea Lord, Sir John Jellicoe, on December 4th, and he generally approved of it, but suggested combining with it a blocking operation. I pointed out that, of course, a blocking operation was a farce, so far as sealing the port against the egress of destroyers and submarines was concerned, and that the destruction of the lock-gates by gun-fire, if accomplished, would be far more effective. But, as Russia had gone to pieces and the Germans were in a position to withdraw their troops from that frontier, and the Allies would have to stand on the defensive in 1918, there was no objection now on the part of the Army to the blocking, and it would prove an exhilarating addition to the proposed exploit for the Patrol. At the same time it would inconvenience the enemy *in case the gates were not destroyed by gun-fire*; so at once the scheme was expanded to embrace blocking. It was evident that the seizing of the Mole would greatly facilitate the blocking operation. The one and only matter that endangered the blocking was the possibility of the blocking ships being sunk by destroyers in the one-mile run from the end of the Mole to the canal entrance. The necessity for rapidly landing on the Mole and seizing the destroyers was, therefore, accentuated by the addition of the blocking part of the programme.

¹ The tide would have been on her port bow the moment she began to slew, and would have drifted her off. Towing the bow was therefore preferable to towing her stern off.

To visualise the probable defensive measures in force at Zeebrugge, it is necessary to place oneself in the position of the German Naval Authorities, and consider the interests they had to defend, and the possible attacks that might be made on them. The principal objectives could only be (1) a landing on the coast; (2) an attack on the craft lying alongside the Mole; (3) a Mole landing; (4) an attack on the locks by torpedoes; (5) a blocking of the canal.

Now for (2), (3), (4), and (5) there was one more or less unanswerable defence, namely, to use the destroyers that were usually lying alongside the Mole at night to sink the attacking craft. If the boats cast off at once and lay between the canal and the Mole end, they would be in a position to intercept any vessels making for the canal or to torpedo any going alongside the breakwater; gun-fire would be far less effective than direct torpedo attack. It was, moreover, the German custom at sea at night to use the torpedo in preference to the gun for attack. This defence was almost unanswerable. The main chance of our frustrating it lay in landing quickly, and boarding and sinking the destroyers at once with bombs. As a secondary measure in case the destroyers had left before the landing party could board them, I arranged for the *John Moore* to have light howitzers mounted on her turret and foc'sle to drive the boats off the line between the Mole and the canal entrance and force them out of attacking distance. This was possible, as the water inshore of this line was shallow.

Now, for a successful blocking, speed was necessary for the ships to traverse the length of the Mole from the Mole-head to the canal in moderate safety with the flanking batteries ashore firing at them. Old cruisers were the only vessels sufficiently speedy, and at the same time suitable as blocking ships. A smoke-screen was provided by the M.L.'s, which were good and had been practised in this for the Great Landing, and although those temporarily lent had returned to their ports, they would soon brush up again. The dispositions of the M.L.'s and the details of their working were made out

for all directions of the wind that allowed of the operation taking place, for, of course, the wind had to be blowing shoreward to drift in the smoke. Three charts were made for winds between W.N.W. and N.N.W., N.N.W. to N.N.E., and N.N.E. to E.N.E. To the westward of W.N.W. a good screen was impossible, as also was the case with winds much to the eastward of E.N.E.

The smoke to be used was white phosphorus and chlor-sulphonic, which were far the best for the purpose. Phosphorus smoke was dense and persistent, and in the dark the burners glowed and lighted the whole length of the screen line and clouds, if there were any, with a dull red glare, so that the attention of the enemy was attracted to a long line, and distracted from the region immediately opposite the breakwater. As explained elsewhere,¹ careful feeding of the phosphorus was necessary—careless feeding probably meant shelling, but this would be a distraction and comfort to all but the boat concerned. Chlorsulphonic might have been valuable closer in.

With a N.W. wind, the general advance was along the line, A B, shown in Plate LVIII ; behind the screen which advanced, spread in the direction C D. The monitors on arriving at the position B diverged from the blocking ships which remained in the offing. If the wind fell light, or dropped, or even changed, which was possible inshore, the smoke-boats ahead of the monitor were at once to proceed at full speed to two areas, x'x, close under the breakwater, trailing out their smoke as they went, which would flank the monitors and hide them, and the boats would be sheltered close under the high wall of the breakwater for the short time before the monitors arrived. At the same time, the trend of the smoke would be watched, and smoke dowsed as necessary to leave the breakwater visible to the monitors as they approached close to it. The officers of these two sub-divisions would have

¹ See Chapter XVII.

been carefully selected, as cool judgment on their part might have been necessary in certain winds at a critical moment.

As soon as the landing-party were on the Mole, a bouquet of rockets would have been the signal for the blocking ships to come in; but, in any case, they were to approach at full speed of course, not more than a quarter of an hour after the monitors were timed to be alongside.

The position ashore now, would have been that the senior German officer had first been awakened by vague reports and had his attention drawn to the Knocke bombardment; then to the gun attack of the destroyers on the Mole battery; then it would have been distracted to the Mole landing; so that, he now, being thoroughly confused, a good chance existed of the blocking-ships getting in sufficiently far not to be stopped, always supposing that the destroyers were not lying in wait for them.

One point remaining that requires explanation is, how the ships were going to find the breakwater. About five miles N.W. of the breakwater end was an occulting light-buoy. This was a valuable guide if it was in its charted position, but it was never safe to trust to this. It was an obvious precaution on the part of the enemy occasionally to change its position. Nor was a daylight "fix" to be relied on, as it might be shifted after dark. Our No. 8 buoy on the patrol line was a geographical position, and had been checked both from the Dutch and Flanders coast-marks. This would have been the kicking-off point for the fleet. A destroyer with taut-wire gear under Commander Fraser would at once have run in and fixed the light-buoy by course and distance, and, if out of position, checked again by going in till he sighted the breakwater, and informed the flagship. One special M.L. would have again fixed the landing-spot before the monitor came in. An aeroplane would have dropped a flare as nearly as possible over the Mole battery, while others bombed the lock-gates; these bursts would have given approximate positions.

A kite-balloon might have been flown from a special vessel to see over the smoke and direct the ships up to the last. I was going to experiment before definitely deciding on its use. It was essential that the ships should hit off the exact position on the Mole, and oceans of thought were directed to this end. It was the crux—the pivot of the whole operation.

This is a brief description of the operation as planned. The broad details of how it was eventually carried out on St. George's Day, 1918, can be gathered from the published despatch, and require comment, not in the light of knowledge after the event, but in the light of troubles foreseen, and how the original plan met these; in fact, how experience, if applied to the scheme, actually tried, would have modified the final results.

First, the *Vindictive* was used instead of a monitor to bring in the troops. This was a mistake. The Admiralty offered her to me, and on consideration I decided not to accept her. Speed was not of the greatest importance if the smoke was properly worked, and, if not, the really dangerous time was when the ship had to reduce speed for making the Mole. The deck space of the *Vindictive* was not sufficient for a large number of men, who would be huddled together and form a compact target; no system of bursting screen protection could be arranged on her owing to her small beam; and she was not convenient as a flagship. The Mole batteries were not seriously and independently attacked, which led to fire being concentrated on the *Vindictive*. The smoke-boats apparently had no orders what to do in case the wind fell. The *Vindictive* was, therefore, unprotected by the screen.

The result was that heavy casualties were suffered on board her on the way in owing to the failure of the smoke to screen the ship, the absence of a strong attack by gun-fire on the Mole battery, and the selection of a ship on board which protection of the men was impossible.

The short brows that were fitted were considerably damaged by gun-fire, and this, combined with the additional damage re-

sulting to them by the *Vindictive* rolling in the swell alongside the Mole, only admitted of the men getting slowly on to the parapet of the Mole—dribbling on to it in fact. Moreover, when on the parapet they had fourteen feet to drop on to the Mole itself, with little apparent chance of getting back again—a fact which must have tended greatly to damp their ardour. To crown all, the delays caused by the foregoing factors and those inevitable in bringing the *Vindictive* broadside on in close contact with the Mole, allowed the German destroyers to man their guns and strafe the landing party at point-blank range. The net result was that four German destroyers lying alongside without steam up were not taken or sunk, and the majority of the men who reached the Mole from the parapet never returned.

I would never have sanctioned taking any ships *alongside* the Mole. Experience had taught me that there was bound to be quite a considerable sea alongside, raised by our destroyers steaming in the offing, and that it was certain to make even a monitor with bulges roll. This would be accentuated in the case of a comparatively small ship like the *Vindictive*. A brow to go right up the parapet, over and down on to the Mole was *a vital essential*. The attack to be a success had to be

“One great rush and one great cheer,”

and not a dribble. If the large brow ahead of the monitor, arranged for in the original scheme, had been shot away, which was possible, though with the safe-guards already mentioned this was not probable, the attack, so far as the Mole was concerned, would have been abandoned, as it was useless attempting it when the essential feature that argued success was absent. Throwing, literally throwing, an avalanche of men ashore was the keynote of success. In short, the daring and fundamental part of my scheme—namely, the landing on the “impossible” outside of the Mole—was adopted, but the details necessary to make its execution successful were altered or omitted through inexperience.

The operation was carried out with the greatest pluck and heroism. The handling of the *Vindictive* was beyond all praise, the plucky example of persistence and cool-headedness on the part of her captain will never die, and the successful handling of the blocking ships is a glory to the Navy. But, instead of the operation being a classical one for foresight and judgment, it failed, and failed just in the very particulars that experience of the coast would have predicted. The blocking ships were of course useless for effectually closing the harbour—a passage could be dredged round them. The time taken to clear a passage depended largely on the morale¹ of the enemy at Bruges and the energy that was put into the work. On the other hand, firing at the lock-gates would probably have damaged them and have effectually stopped all use of the canal. The use of a submarine loaded with explosives to blow up the jetty connecting the Mole with the shore was an admirable conception heroically carried out.

It is now necessary to hark back to the relations with the Admiralty over the plans.

While adding the blocking scheme to the programme of the attack on the Mole, a document was received from the Admiralty, called a plan for blocking Zeebrugge. I returned it, pointing out that it was quite useless, lacking in every requisite for the success of such an operation, and saying that it evidently had been made out by officers without experience of the coast or of the essentials of such operations; in fact, it was “a compass, chart, parallel ruler plan,” and based on theory and not on practical experience. The one point which showed a streak of imagination was the blocking of the two ports, Ostend and Zeebrugge, the same night. That was sound if cruisers, not merchant ships, as was suggested, could be obtained in spite of the shortage. The remainder of the plan lacked the basis of success. The attack was

¹ The Folkestone-Grisnez barrage laid by us at the end of 1917 was undoubtedly helping to destroy morale at Bruges at the time of the Zeebrugge blocking, owing to losses in submarine boats.

to be in daylight. This, of course, was lunacy. Slow merchant vessels were proposed; this was quite out of the question; 16-knot ships at least were required. The Mole was left unattacked, and consequently the batteries and destroyers undisturbed. There was no suggestion of a bombardment of the lock-gates.

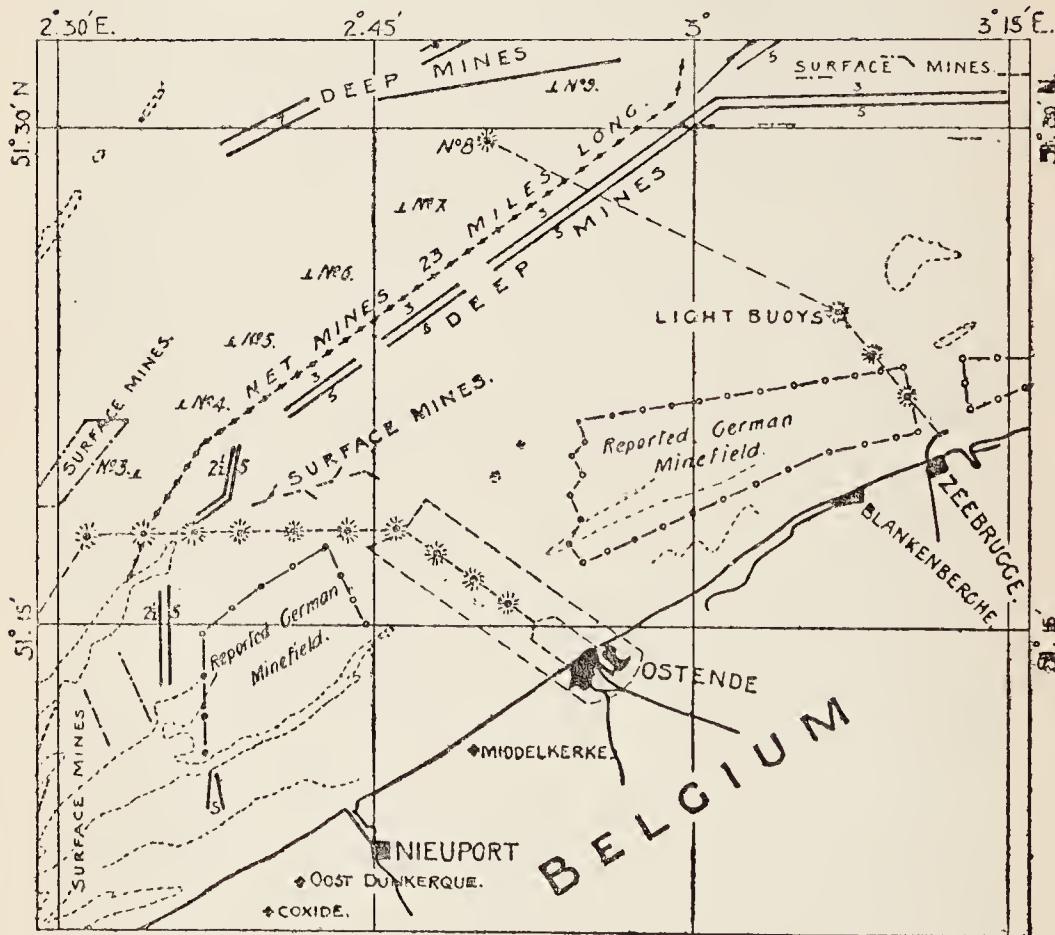
In fact, the plan was exactly such a one as might have been expected from a committee sitting at the Admiralty with no experience of the Belgian coast. The blocking of Ostend, however, was a good point, and I proceeded to include this in the original scheme. Not that it was possible to block Ostend completely any more than Zeebrugge, but it added a finish to the operation—a really good sound finish. With Ostend, the only difficulty was to find the port, and this was not to be lightly discounted. It must be remembered that at one hour before high water, which was the proper time to block—not three hours after, which was approximately the time of the second actual attempt—the tide was setting in the offing at a variable and increasing speed to the eastward. The time of one hour before high water I therefore fixed so that the weak flood-tide and the east-going stream would tend to carry the stern of the ship across the channel after the bows had grounded—a most necessary precaution. With a “bow grounding,” it would be possible at dead slack tide with the east-going stream to manœuvre the stern across the entrance, whereas without an east-going stream and with the slightest ebb this would be impossible to do.

The ships in approaching Ostend from the N.W. or N.E. had to cross the tide in the offing, the strength of which it was impossible to forecast. Now in our Great Landing arrangements for fixing the position of the ships had received the utmost attention, and it may be remembered that “taut-wire gear” from P-boats was going to be used. This gave one method and was arranged for. Two P-boats were to leave the leading lights off Oost Dunkirk at a definite time, and steam 5,000 yards off the coast, dropping an acetylene

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bouy with the light visible about 4,000 yards dead in line with the entrance; but this, in itself, was not good enough—an accident might happen to them, such, for instance, as being dropped on by a patrol.

A second system was therefore elaborated. It consisted



in dropping light-buoys from P-boats astern of the blocking ships; each boat had a qualified navigating officer and a special compass, and each buoy in succession was to be dropped on an exact compass-bearing from the last one laid. These are shown in the above diagram. By this means, a compass-line of bearing astern was fixed for the ships with some degree of accuracy, free from all consideration of tide.

As soon as the taut-wire light-buoy had been placed, an M.L. was to go in and find the entrance, and be ready to signal to the incoming vessels. These, together with the ship's own reckoning, provided four checks on the course in. Aircraft dropping flares provided a fifth, and probably a kite-balloon a sixth method.

It is understood that at the first actual attempt these precautions were neglected, and a German light-buoy relied upon, with the result that the harbour was never found; and at the second attempt the tide was ebbing, and the east-going stream slackening, under which conditions blocking was practically impossible. The time fixed, according to Commodore Lynes's report, was an hour after high water. Delays extended this considerably. If the harbour could not have been entered by midnight, the attempt should have been postponed. Between 1 a.m. and 2 a.m. the tide fell three feet in the harbour. It is only fair to the *Vindictive*'s officers to point out that the time of blocking made the success of the attempt impossible. In a second attempt the enemy would be sure to be on the alert, and know what to expect, and at Ostend would not improbably have been ready to assist the ebb tide with the water from the Bassin de Chasse.¹

Experience is a thing so subtle and unobtrusive that it is often little appreciated by those who have the ruling of affairs, yet it is the paramount factor in planning all operations.

It is impossible to have a better example of how want of experience wrecked a scheme. Gallantry, zeal, energy, all were present to the uttermost, from the Admiral to the First-Class Boy, but experience was lacking. Instead of this operation, the last naval operation of the war, being a model, a classical model, the Mole landing was a disaster; and Ostend,

¹ A *bassin de chasse* is a large reservoir filled at high water and used at low water, in the absence of a river, to sluice out the entrance of a harbour to keep it clear of mud.

after our having patrolled close to it for nearly a year and a half, was not found on the only occasion when it was really necessary, and all through want of experience.

In giving his provisional approval to the Zeebrugge scheme, as I had planned it towards the close of 1917, Sir John Jellicoe, the First Sea Lord, desired me to explain its details to the Operations Committee. On Tuesday, December 18th, 1917, I therefore went to the Admiralty and met him, Admiral Sir Henry Oliver, Deputy Chief of the Naval Staff, Vice-Admiral Sir Rosslyn Wemyss, Rear-Admiral Roger Keyes, President of the Operations Committee, and the other members, and explained fully to them my proposals, and obtained the final approval of the First Sea Lord.

Sir John Jellicoe, however, wished me to explain the scheme to the Sea Lords, as the Admiralty would be implicated. Accordingly, on December 29th I attended the Admiralty to do so; but, on arrival, was told by the First Lord, Sir E. Geddes, that I was superseded in my command, so that further action on my part was unnecessary. At the same time Rear-Admiral Keyes was given the Dover command.

Although I had explained the whole scheme fully to him as President of the Operations Committee, so impressed was I with the necessity for attention to certain points, that, knowing he had had no experience of operations off the Belgian coast, and, necessarily so, I wrote him the following notes, after leaving, at the risk of seeming interfering :

"The chief difficulty is hitting off the exact spot. Several checks will be required—taut-wire gear—but the difficulty lies in running this across the tide. The position from the occulting light-buoy can be fixed by this method *en passant*; this necessitates fixing the occulting light-buoy shortly before. The Hun may move it slightly; watch this, and above all fix it by a method which does not attract attention. Leave no detail to chance. Kite-balloon towed by a destroyer may be useful to see over smoke. Flares dropped from aeroplanes will be a rough guide. Navigating in by dropping moored

light-buoys from surveying P-boats astern of leader. Leader should form a column with nothing astern of her. Charges¹ should be special ; those for lock-gates so that five degrees of elevation gives 2,000 yards range.² Present special charge will do for seaplane base. Six-inch require special charges also. Think out thoroughly pros and cons of searchlights and flares, and when and where to use them. I consider the landing best arranged by holding a defensive line just to the west of the two eastern large sheds. Only let raiding party go beyond this to sink dredger, otherwise they will hamper the use of heavy gun-fire. The use of the defensive line is to cut off the port from the Mole end. Machine-guns with good bullet-proof shields will be required and sand-bags for protection from bombs. The line should include the coal dump. Speed of jumping is everything. Use great discretion as to when you commence smoke, wind, speed, direction ; distance from Mole govern this. Remember it will take five minutes to form a screen. Everything depends on hiding the main operation. Have a destroyer diversion therefore, to give a false idea. For the same reason fire at the batteries that do not enfilade the main attack. In any case, you will not hit them, so give a false impression by firing at the wrong ones. Give the idea that the attack is to eastward of the Mole. As regards control of fire I have my own views, which I would have carried out ; but your gunnery experts are sure to differ, and you had better follow their cast-iron methods. There are, of course, hundreds of points. Spend three hours daily, separate hours preferably, going through the operation step by step, varying points of first alarm, different winds and smoke casualties, and put yourself in the place of the Bosch, and see how you would counter if you guessed the attack, and how you would act if you did not guess the attack, and also if you had to change from one counter to another and their difficulties, and see how you can increase those difficulties. This will strengthen your attack, and at the same time give you a better idea while the show is in progress what is in the Bosch's mind.”

¹ These charges were for the 12-inch monitor firing at the lock-gates.

² I never imagined that the original scheme with the use of monitors and the bombardment of the lock-gates would be departed from.

I then went on to deal with the Bruges bombardment, but this is quoted elsewhere.

In conclusion—instead of the posts of honour in the blocking ships being given to officers of the Dover Patrol, who in foul weather and fine, through disappointments without number, had borne the burden of three years of hard work, they were all given to officers outside the Patrol. There were officers in the Patrol just as gallant as those who were selected from outside. I cannot say more gallant, as nothing could excel the devotion with which they carried out their work. But to me the most bitter results of the undertaking were the loss of the gallant Halahan, an officer for whom I had the very greatest regard, and the exclusion of the officers of the Patrol from the posts of honour in the very operation that had been largely planned with the view of recompensing them for their great services and unadvertised work for three years in the Dover Patrol.

Many readers of this chapter may perhaps question the utility of discussing the failure of the attack on the Mole, and in all probability their first thought may be that it would have been better to let the matter rest with the halo of success crowning the attempt. After due consideration I could not agree with this view, since it is useless deliberately to discard the bitter lessons taught by experience. To do so is merely to court greater disasters in future wars. If ever again we are at war, I hope that the memory evoked by the word "Zeebrugge" may bring home to the Board of Admiralty the consideration that appointments or change of appointments to commands on the eve of operations involve the failure or success of our arms, and govern the destinies and lives of those who serve in the lower grades and ranks. They may then be forced to halt and ponder on the question : "Can man, merely by appointment, suddenly experience gain ? "

In peace, that great training period, appointment is the sieve which sifts the likely from the unlikely to succeed

when in command in war ; all sorts and conditions of experiments can be tried. In wartime the period for probation has passed, and changes in appointments are serious matters. It is for this reason that a considered account of the Zeebrugge Mole operation is worthy of thought and digestion which, I trust, may bear good fruit.

ZEEBRUGGE

Dark frowned the Mole, forbidding reared its wall,
Onward the ships brought in that gallant band.
Shell-scorched in death, in agony they fall
Who only thought of fighting hand to hand.

When that brave band sore thinned by those who fell,
Had scaled the top and forward forced their way,
They faced an abyss leading to a Hell,
Prepared through warnings given by delay.

Valour demanded dropping twice their height,
With feeble chance of scaling back again.
Few had survived to mingle in that fight—
Those few, so few that valour died in vain.

High on the Mole a monument is reared,
Recording the prized valour of that band
Of Heroes who there died and never feared,
Obeying without question that command.

Sleep on brave souls shrouded in glory bought
By your great courage—you died not in vain.
The purpose of your strivings now is naught,
The lessons gained eternally remain.

CHAPTER XI

THE CONTROL AND PROTECTION OF TRAFFIC

The proportion of ships lost by enemy action—Four forms of attack—A possible operation by the Germans—Submarine mine-layers at work—Objections to holding up traffic—The danger of wrecks—Advocacy of a single command for the English Channel—Suggestions to the Admiralty—Traffic at Calais and Boulogne—The loss of the hospital ship *Anglia*—The mining of the s.s. *Maloja*—Casualties among merchant and patrol vessels—Cross-Channel traffic—Sailings by day adopted—Possibilities of raids—The German mine menace—A reply to complaints—Irreplaceable transport vessels—Fine service of the masters of transports.

THE Dover Straits form the bottle-neck of the traffic to and from the Thames, the main route of the east coast trade to the ports of the world, and, in addition, through it in the late war the supplies for the French, British, and Belgian armies in the north passed to Calais and Dunkirk. A considerable coal traffic came from the East Coast to the French ports via the Straits for the supply of our Allies, France and Italy in particular. Coal was essential to them both for the manufacture of munitions and the necessities of the civil populations, and its conveyance in 1916 and 1917 was a matter of the utmost importance.

Approximately 120,000 steam merchant vessels passed through the Downs in the years 1915, 1916, 1917. Of that number fifty ships were mined, or about the twenty-fifth part of 1 per cent.; one only was lost by the enemy's gun-fire, or the one-thousandth part of 1 per cent. With the cross-Channel traffic, which is not included in the above calculations, I will deal later.

In quoting these figures, it is important to remember that Dover was nearer to Ostend, the vaunted submarine and destroyer base of the enemy, than it was to Brighton. This

chapter will, I hope, explain how this striking immunity was attained.

In the chapter dealing with the Trawler Patrol, certain aspects of traffic protection were necessarily touched on. These will now be more fully dealt with.

It is necessary to keep clearly in view what were the dangers to our traffic in the narrow waters of the Channel. There were four main forms of possible attack—two below water, from submarines firing torpedoes, and submarines laying mines; and two above water, arising from attacks by destroyers by day and attacks by similar craft at night. The attack which would have been the most deadly was one in force on the Downs and our shipping routes at night. It is appalling to think what the result might have been. If Germany had possessed any one even faintly reproducing the genius of Francis Drake or Jean Bart, the Downs might have been any night a blazing furnace and in the morning a graveyard, with masts marking, like tombstones, the last resting-place of the vessels. The line of conflagration might have extended from the South Goodwin to Dungeness and from Dunkirk to Boulogne.

Let me for a moment sketch such an operation. A feint with the German High Sea Fleet would have been made up north, the ships leaving port in the afternoon ; but at dark twenty-eight of its destroyers would have switched down past the Dutch Coast to Ostend and Zeebrugge, there joining twelve vessels based on the Belgian coast, making forty in all. The High Sea Fleet, staying at sea close to their mine-fields, would have kept up the deception and would probably have attracted Commodore T.'s light forces from Harwich to join up with the Grand Fleet, fully expecting that the Germans intended to fight.

The next day the destroyers would have oiled, and at dark left according to schedule times in six divisions, four of six boats and two of eight boats. The first division of six boats would have steered straight for Dungeness down the centre of the Channel ; the second of six boats down the centre of

the Channel for Boulogne; the third of six boats and the fourth of eight boats for the South Goodwin; the fifth of eight boats for the North Goodwin, and the sixth of six boats for Dunkirk.

The Dungeness and Boulogne boats would have been timed to arrive at their assigned places half an hour before the other divisions reached theirs, and would then sweep up the coast each side, sinking everything they met. This would have attracted all the British destroyers, except those in the Downs, to these parts of the patrol. The divisions of eight boats, arriving at the North and South Goodwins, would have closed like pincers on the Downs anchorage, where anything up to one hundred ships would have been found. The other two divisions would have swept down the coast each side to meet the divisions coming up and to support them if attacked by our weak Patrol. We would have been hopelessly outnumbered. And, next morning, the nation, furious, would have learnt that millions of pounds of cargo and scores of vessels had been lost! And the German losses? A matter of luck—one or two destroyers possibly sunk, one or two disabled by gun-fire or collisions. But a chapter would have been written in the naval annals of our country that never would have been forgotten.

The fates were indeed kind to us in handing the control of the German Navy to men unable to appreciate the strategy of a Power comparatively weak in battle-ships, but strong in strategical position and destroyers.

This danger, either in bulk or in instalments, was always present in my mind in making my plans for the defence of the Straits. Futile attempts, tenth cousins to the attack I have sketched, were made on our cross-Channel transport route, of which something will be said later, but the great conception pressed home with courage was missing.

The real practical danger to our shipping, and the one that the enemy systematically attempted, was the mining of our routes with mines laid by submarine boats. When these

mine-fields first appeared the problems they opened up were entirely new. The subtlety of the system, its secrecy and its possibilities, raised factors differing entirely from the ordinary and accepted methods of dealing with surface mine-layers. We were without experience to enable us to grapple with the evil, and, therefore, had to begin by groping in the dark.

Naturally the first instinct on discovering mines, usually in the early days owing to the loss of a ship, was to stop all traffic until the mine-field had been located and cleared. But very soon I became impressed by the clumsiness of such a method. If traffic was suspended in the Dover area for a single day it meant 1,200 ship-hours lost—that is, the equivalent of one ship's steaming for fifty days and nights. It was, therefore, apparent that the remedy of stopping traffic might well be worse for the country than the evil it was intended to counteract so far as commerce carrying was concerned. Very little experience taught us that the mines laid at one time by a submarine were comparatively few in number, and the area in which they were laid was small. We therefore introduced a system of declaring an area round a mine, whose location had been revealed, to be a dangerous area, and diverting traffic outside this region. The size of the proclaimed area was generally a circle of one and a half miles' radius, but if the spot was far from the shore and the weather misty, so that the position of the mine had to be estimated, the radius was increased to two miles. This system was subsequently, I believe, generally adopted.

As a corollary to such a system, it was necessary to have more or less perfect means of communicating with and warning the traffic. I have already explained how the traffic was confined to routes and how "controls" were instituted at the *Royal Sovereign* Light Vessel, Folkestone Gate,¹ and the

¹ Folkestone Gate was marked by two light vessels. Originally it was intended as a gateway in the cross Channel boom, which was designed in 1914, but which failed in practice. All up and down Channel traffic passed between these two lightships.

Downs. These "controls" enabled complete surveillance over the traffic to be maintained, so that gradually, from these two systems only, we evolved methods of dealing with the mines which became more or less perfect; the heavy clouds of doubt cleared with experience, and we saw our way to defeating this apparently deadly form of attack. Of course accidents still happened. It may be remembered that, in giving a description of the German mine, I pointed out that it might stay on the bottom for weeks until shaken up by a gale of wind. This was one of those developments with which it was most difficult to deal. Chain-sweeping eventually helped us greatly, but the weather did not always permit of this being carried out.

Again, sweeping could not be carried out except in daylight, so that mines laid after dark, say at 11 p.m., could not be discovered till perhaps 7.30 a.m. the following morning. It was, therefore, necessary on occasions to stop traffic through the more dangerous areas between midnight and the morning sweep.

The areas which I have characterised as the "more dangerous" ones can easily be traced by referring to Plate LX. On the English coast they were in the neighbourhood of Beachy Head and the portion of the route between Folkestone and the Downs. The dangers round about Beachy Head had to be accepted, but frequently I held up traffic between three miles west of Folkestone Gate and the Downs. Off Folkestone, therefore, just before daylight, we had an assemblage of merchant vessels, often a score or more in number, but never were these attacked by the enemy with torpedoes.

One other restriction was imposed, and that was on vessels of very large size and therefore of capital value. These only passed these areas when the tide was running strongly, and therefore any stray mine was deeply submerged.

An additional danger existed at narrow passages, such as the entrance to the Downs by the South Goodwin Light

Vessel. It was impossible to sweep efficiently near a sunken vessel. The sweep-wire fouled the mast or bridges and became useless ; hence areas close to wrecks had always to be treated with suspicion in case a new mine-field had been laid in their vicinity, or some of the old mine-field was still existing and protected by the wreck. Two or three ships sunk in the south entrance to the Downs would have gone far to restrict free traffic, which was a strong reason for sweeping this passage in the morning before allowing traffic to pass. But the desirability of not curtailing the hours of traffic was always present in my mind, and several times when the Admiralty tried to run the traffic in the Narrows, I was able to pay no attention to a telegram ordering suspension of traffic.

We hunted the torpedo-carrying submarines out of the Straits so far as daylight attack was concerned. This wore the poor 6th Flotilla to the bone, but constant and unremitting hunting gave complete immunity to our traffic. I always, however, feared the use of the submarine on the surface at night.

In 1915 I advocated putting the control of all the channel traffic under one Admiral, and I still consider that such a procedure was the right one in war-time. To divide the patrol forces among three areas prevented a submarine being followed and dogged from area to area. Under the single control of one Admiral, reinforcements could have been sent to any locality from one where it was quiet at the moment. Such a control would have been exercised by one man on the spot—not from the Admiralty, as instant action was the chief requisite. Of course, the function of the Commanders-in-Chief at Portsmouth and Devonport and the Admiral at Dover would have been curtailed so far as traffic regulation was concerned ; but it may be suggested that during a war the commands at those ports should be subordinate to the Commander-in-Chief in the Channel.

The Admiralty at one time attempted to control traffic, and issue instructions as to stopping the passage of ships. This was a task which it was impossible for them to discharge efficiently,

at all events so far as Dover, with its peculiar difficulties, was concerned. The man on the spot could, and did, deal with the situation the moment it arose. What happened was this. The skipper of the trawler on discovering mines took instant action by diverting traffic and informing the trawler fitted with wireless telegraphy. The lieutenant of the division on the spot took charge at once. As soon as the message was received by the captain of the Trawler Patrol, out went the sweepers and he also telephoned to me a proposed route; when I had arranged the route, which involved many general considerations, it was transmitted by wireless to the divisional officer, but meanwhile some safe route had been adopted by him. The Admiralty was then informed that mines had been found. Several hours later instructions would come from the Admiralty. This procedure, which might have been fraught with considerable danger, was gradually, I am glad to say, abandoned. But in future wars I hope departments at the Admiralty will not try and run active commands. Such departments are equipped for dealing with dead, not live, matter. The man on the spot knows whether it is blowing or calm, clear or foggy, and, if worth his salt, can make dispositions infinitely better than some officer in London with nothing but a chart to guide him. The business of the departments at the Admiralty is to collect and transmit information, but not to assume executive functions. These belong solely to the Chief of the Naval Staff, and again should only be exercised by him on special occasions of real importance.

The maintenance of traffic argues keeping the navigational lights burning, otherwise accidents to vessels from strandings will inevitably take place. The efficiency of an area depends on avoiding accidents of all kinds to shipping, whether by collision or stranding, as well as sinkings due to mines.

Now the Germans used our navigational lights freely to fix the positions of their mine-fields. If we could have extinguished all our coast lights, mining would have been con-

siderably reduced, but tonnage-hour-carrying considerations necessitated keeping up the night traffic. As it was impossible to conduct this without lighthouses and lightships, we had to put up with the dangers that their use entailed. One slight compensation resulted. Since mine-fields were never laid except fairly close to our light-vessels or lighthouses, "close" sweeping could be fairly well confined to those localities.

As many lights as possible were extinguished, and the others reduced in brilliancy and screened so as to show in the direction of the line of traffic only; but these two latter expedients were of small value. After the raid on the northern extremity of the Downs, when the *Grey Point*, anchored in the open and in a prohibited position, was sunk, the question of a more rigid protection of the Downs became urgent. This I deal with in a subsequent chapter, but I may say here that the remedies adopted stopped all raiding.

The same thing occurred at Dunkirk through a rather different reason. Right up to the early months of 1917 we maintained our unimpeded night-traffic, as Dunkirk was the main supply port for both our Army in the north and also the northern part of the French Army. One of the greatest marvels of the Patrol was why the enemy did not raid that traffic route close to Ostend, flanked on one side by the open North Sea. There are only two explanations. First, the barrage-line of nets protected it in this direction, and certainly German destroyers were well advised to keep clear of them; secondly, the enemy was afraid of his own mine-fields. The latter should not have been a serious consideration, since one good raid would have done more damage than a year of mining, so that really the net-barrage must take the credit until some other explanation is forthcoming.

The winter of 1916-17 saw Dunkirk so unmercifully bombed¹ that the harbour authorities decided that it was inadvisable to pass ships through the lock at night into the basin since one might be bombed in passing through, and

¹ See Plate LXX.

the entrance blocked. If the ships were not passed through at night, it obviously was no use to pass them round the coast to anchor off Dunkirk. After consultation with Admiral Ronarc'h,¹ I held up all merchant traffic at Calais or Boulogne until such hours as they could fetch Dunkirk when the locks were open. This enabled us to put out the Dyck light and the Walde light between Calais and Gravelines. The latter light was probably more used by the Germans for laying mines than any other in the Channel. The Channel buoys up to Dunkirk were also extinguished. The result of this action was magical, nearly all mining in that area ceasing forthwith. But, except for the closing of the Dunkirk locks, stopping the traffic would not have been justifiable.

I was never anxious when in command at Dover ; to have allowed oneself to have become worried would have been the beginning of insomnia and the end of one's utility. But that strip of traffic went nearer to causing me anxiety than any other part of the Straits. The Downs I could cope with to some extent, but there was no means of defending that twenty miles from Dunkirk to Calais, absolutely inviting attack. There were only two or three gallant little French torpedo-boats by way of protection, and Ostend was only between thirty and forty miles off. I had no vessels to spare, and, even if I had had any, the defence of a twenty-mile route with an open flank to the North Sea was so impossible that it could not have been efficiently carried out.

There was a considerable traffic of Inland Water Transport barges between Calais and Richborough, one of the bases of supply of the Army. These barges were a danger, since at night-time they resembled submarines, were most difficult to observe by our fast-steaming destroyers, and led to grave risks of collision. Their passage across had to be limited to

¹ As will be explained later, the whole of the Allied Naval forces in the Dover area were under my orders but, of course, I always discussed proposals fully with the French Admiral.

daylight hours, which, however, caused little inconvenience to them.

One other trouble regarding traffic which arose was the enemy's attempt to attack our trade route at night by submarines with torpedoes. This development resulted in my asking the Admiralty to enforce sailing between Beachy Head and Folkestone Gate with navigation lights extinguished. Obviously a submarine had merely to wait in the vicinity of our traffic line till it saw the steaming light of a steamer, approach it till it made out her bow lights, and then bring off an attack. Considering what excellent night surface torpedo-craft submarines are, I always looked on this as the most deadly of all possible forms of attack. If, however, the ships navigated with lights out, a submarine lying in wait stood a fair chance of being run over without sufficient warning to get out of the way, and very little chance of bringing off a successful attack. Submarines hate to see a huge mass towering suddenly close to them—it makes the spine of every one on board creep. At all events the result was successful, and the night attack was not persisted in. To make the system safe, however, meant running two lines of traffic three miles apart, one east-going, and the other west-going, so as to prevent collisions. Bow lights were kept ready for instant exposure in cases of emergency. Of course, there were frequent omissions to extinguish lights in spite of the excellent look-out and control exercised by the trawlers. Such sporadic omissions, however, did not matter much provided the bulk conformed to the restrictions.

I do not remember a single collision due to the inauguration of this system. Of course many evils were prophesied, but, like most inexperienced croakings of like description, they proved to be merely mists of the brain.

Some of the most vivid happenings as regards traffic naturally flash back in writing these pages. There was the sad loss of the hospital ship *Anglia* by a mine—the only hospital ship damaged in this area either under the Red Cross, or as a

slate-coloured ambulance transport.¹ Only a short time before she had brought back to England His Majesty the King, injured from his accident in France. Well I remember that day when, in considerable pain, he was carried on board. His medical attendants were anxious that he should not suffer from the bad weather. I had come over in a destroyer and noticed a rising north-easterly wind and sea, and while waiting at Boulogne the weather got worse. At that time of the year it would have been quite possible to have been held up by bad weather for ten days or a fortnight, so, in spite of the ominous conditions, I determined to sail. It was a great relief next day to hear that His Majesty was none the worse. But, as a matter of fact, had we not left, it would have been impossible to have done so with moderate weather conditions any day for the following fortnight; so we were fortunate. Again, that day I remember telling the Captain of the *Anglia* as we approached No. 8 Net Area buoy, to turn well short of it, as I hated buoys—often German mine-fields were laid near them. It was near the same buoy that the *Anglia* was mined a short time afterwards.

On this latter occasion vessels were soon at the spot to help, but unfortunately the engines of the ship were left going ahead when the engineers were driven from the engine-room by the rising water, and the helm was jammed over. The result was that the *Anglia* continued to forge ahead, turning in a circle which made it most difficult for any of our vessels to get alongside. One torpedo-boat did extremely well, she went alongside three times and saved a considerable number of the wounded, each time after a short spell being thrown off owing to the curved track of the *Anglia*. The nursing sisters behaved with great heroism, but many more of the cot cases could have been rescued had the engines been stopped.

¹ When the Germans commenced their inhuman attacks on hospital ships with submarines, it was obviously not only useless, but extremely dangerous for them to exhibit their distinguishing marks in daytime and their illuminated Red Cross at night. They were, therefore, painted the same as the ordinary transports.

Much the same thing happened when the *Maloja* was mined off Dover. In this case the engines were put full speed astern and again not stopped. Had they been stopped, not one soul on board need have got his feet wet. Numbers of our small craft were soon on the scene, and could have gone alongside; but the stern-way of the ship rendered this impossible. A small merchant vessel was mined at the same time, and one of our drifters subsequently was blown up, and sank on top of the *Maloja*.

One vessel—the *S.D. Lambert*, Captain W. Lamb—was mined, and, as usual, whenever time and opportunity offered, I saw the captain. I asked him if this was the first time he had been mined, and he replied, "Bless you, no, sir; this is the third time." "I suppose you will now have a bit of a rest," said I. "No, sir," he replied; "I've got three sons in the trenches. I am going north to get another ship, as father has got to do his bit too." Can we wonder at winning the war with so great a spirit inspiring our Merchant Navy?

The control of the traffic brought me many bad moments, both day and night, when routes had to be altered or patrols reinforced or changed according to the experienced interpretation of reports as to whether a submarine or mine had been the cause of an accident. If a submarine was diagnosed, then the patrol of that area was doubled, the destroyers intermediate with that position moved up one place, and one of the boats resting turned out to fill the easternmost billet. If mines were scented, diverting the traffic had to be considered. Captain Howard of the Trawler Patrol, as my traffic manager, did excellent work both by his efficient organisation, and in training and instructing the crews of his vessels, which greatly simplified the adjustment and alteration of the traffic routes.

The following is a synopsis of the merchant and patrol vessels sunk in the Dover area for the years 1915, 1916, 1917:

	Last half	1915	1916	1917
Merchant Vessels lost : Mined	.	.	14	26
" " " Collision	.	0	1	4

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	Last half 1915	1916	1917
Merchant Vessels lost: Gun-fire . . .	0	1	1
" " " Torpedoed . . .	0	1	5
" " " Accidents . . .	0	0	1
Patrol Vessels lost: Mined . . .	8	6	9
" " " Collision . . .	0	3	1
" " " Gun-fire . . .	0	7	0
" " " Torpedoed . . .	0	0	1
" " " Stranded or foundered	0	1	2
Approximate no. of mines destroyed . .	132	313	755
Approximate no. of merchant ships passed	40,000	36,000	32,000
Percentage total loss of merchant vessels	.035	.08	.066

The above analysis is of interest as it brings out clearly the following points :

- (a) The increase in mining by the enemy.
- (b) The increased efficiency of our sweeping and control methods in 1917, since 10 ships only were sunk that year for 755 mines swept up, whereas in 1916, 26 ships were sunk for 313 mines swept up. In 1916, mining was practically stopped by the Belgian Barrage for six months. Had it not been for this, nearer 50 than 26 ships would have been lost in that year. Similarly, on a twelve-month's basis, 16 patrol vessels would have been lost in 1915 and 12 in 1916, compared with 9 in 1917.
- (c) The increase in the number of vessels torpedoed in 1917—this was checked by the double traffic line.
- (d) The small increase in loss through collisions in spite of navigating lights having been put out.
- (e) The loss of patrol vessels mined, compared with merchant vessels mined in 1917, is good evidence of the fearless way the sweepers and other vessels carried out their duties.

These figures show how we mastered, in large measure, the mining evil, although our routes ran perilously close to Ostend and Zeebrugge.

As to the cross-Channel transports, their protection was

naturally a matter of paramount importance. The success with which this was carried out was not due to accident, or, on the other hand, entirely to want of enterprise on the part of the enemy. The nature of the protection, and its extent, varied with the general conditions on the Belgian coast and in the Channel. As time went on and the immunity of the vessels continued, their protection and the continuance of our unbroken record became an obsession—almost an article of religion.

In the early days the transports were run entirely by night, the advantage claimed being that the vessels were invisible, and, therefore, less likely to be attacked by submarines. This arrangement I altered, however, for several reasons, chief of which was that, on any but a really dark night, submarine boats were most efficient surface torpedo-craft—being much more invisible to patrol vessels than the latter were to them, as they were very low in the water. I had constantly in mind an incident which happened when I was in command of the British Submarine Service at the time when we built and introduced the first submarines into our Navy. One night, during some manœuvres off Milford Haven in 1904, I was out in a submarine, and was able on the surface to approach and hail one of our destroyers on patrol an appreciable time before she saw us. In fact, we carried on a conversation without the submarine being seen.

I always feared that the Germans would use their submarines on the surface at night rather than submerged in the day-time. It would have been very difficult to protect our traffic against such an attack.

A second reason was that the waters to the eastward of the cross-Channel route could not be so efficiently viewed and searched at night as in the day-time, and the approach of enemy destroyers and submarines could not be so readily detected. Another strong reason was that, if a vessel were torpedoed at night, saving life would be more difficult in the dark, and the casualties correspondingly higher.

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The attack by destroyers at night was also always a real danger ; in daylight this largely became impossible—except in thick weather.

The general conditions of the Patrol were that in 1915 the drifters, supported by the destroyers, occupied the net area,¹ —the large rhomboidal area, of about 400 square miles lying approximately between the South Goodwin, the Ruytingen shoal, Grisnez and Folkestone—and guarded the main breadth of the Channel to the eastward, both by day and by night. All destroyers, which were not boiler-cleaning, had steam up and were ready to slip. One of the light cruisers—we had only two—also had steam ready. The advisability of keeping the destroyers at “the ready” has been criticised as being too severe on the boats, steam at an hour’s notice being advocated instead. But at Dover we were up against a real and no fancy problem ; we were every minute at war, and could not afford the luxury of rest. Every submarine sighted had to be hunted, and hunted quickly. Moreover, the enemy’s destroyers could have raided the cross-Channel transports before boats at one hour’s notice could have intervened.

The alteration from night to day sailing was amply justified in that the raid by German destroyers on the Patrol on October 26th, 1916, sold the enemy completely, no transports being met with, except one empty one ; and again, this might have happened on the night of February 25th, 1917.* Had the old system been in vogue, three or even six transports might have been damaged or sunk on either occasion.

As time progressed, it was evident that drift-nets were out of date. The enemy submarines knew all about them, and their function, and merely steamed clear of them. The drift-net divisions were, therefore, removed and used to look after permanent explosive nets. This left the net area clear of observing boats. In hazy weather it was impossible to rely on the usefulness of any isolated patrol vessels to observe so large an area, or ensure immunity from submarines.

¹ See chart of Patrol area.

² See page 346.

The destroyers, therefore, which had been used to protect and support the drifters, and patrol the offing, were in daytime allocated to escort the transports. These were more than once of value in dealing with submarines, which otherwise would have attacked the transports.

The object to be gained in arranging an escort is to dispose the boats so that they are in a position to jump on the back of any submarine attacking the transports. By this means the submarine, being in imminent peril, is embarrassed, and is obliged to forfeit the best position for attack. Probably it has exposed its periscope and given away its position, and, even if it runs the risk of trying to take up another position after such exposure, it would be too late to do so effectively. The escort, therefore, is a protection by being a deterrent. Because an actual attack by a submarine on a transport was not made, is no argument that there would not have been one had the transport not been escorted. The fact that enemy aeroplanes were bound to see that the ships were escorted must have made submarines chary of making an attack.

In hazy weather, after the net area had been abandoned, the danger of a destroyer raid became greater. The predominant feature of the situation was that Ostend was only sixty miles from the centre of the Boulogne-Folkestone traffic line. In clear weather enemy destroyers would probably have been observed in sufficient time to be met and their penetration of the Narrows prevented. In thick or misty weather this was not so. Assume a visibility of five miles, a common condition in the Straits. Air observation would, of course, have been non-existent. The Channel was twenty miles wide —any portion five miles from each shore would have been secure from observation from the land—so that a strip ten miles wide in the centre of the Channel was open to the raiders. It was rarely that any destroyers were available to patrol the centre of the Channel. But, assuming that the Germans did raid, and that they were not observed when crossing a line Calais-South Goodwin, they had only fourteen miles to

steam to the centre of the transport route. This, at thirty knots' speed, meant twenty-eight minutes' steaming. They could, therefore, have gone for the transport route and struck it anywhere five miles from either coast, and steamed along it until observed by transports and their escort.

Five miles' steaming would mean only ten minutes, so that by the time the transports appreciated that the vessels were German, they would have been well within range, and the raid would have become deadly. The information now would have been wirelessed to Dover. The reserve boats and the one cruiser would have been ordered to slip. Between ten minutes and a quarter of an hour would have been occupied in getting clear of the harbour. It was fifteen miles steaming to a point five miles from Calais. The only chance of cutting off the enemy boats lay in steaming straight for Calais, trusting to the escort destroyers to keep touch with the enemy, and to signal their line of retreat. This information was essential, otherwise the enemy, if lost touch of, might have struck for a point five miles off Dover and crossed it at a time when our cruiser and destroyers were five miles off Calais.

It will be seen that the possibilities of such a raid were great when studied from the enemy's point of view. He had quite a good chance of breaking through and sinking some of the transports, and, on the way back, might well have dodged our cruiser and reserve boats, or, at the worst (German worst), have fought an action with a cruiser and some considerably inferior and more lightly-armed destroyers.

If, on the other hand, the Germans were seen crossing the entrance to the Narrows, their correct procedure would have been to have turned back, since without doubt the transports would have been warned, and either have returned to their harbours or been sent full speed down Channel. The possibility of such a raid necessitated a patrol near the centre of the Channel on the Calais-South Goodwin line, and the cruiser and destroyers being at the ready in the harbour.

Besides the possibility of a destroyer raid, the destroyers in

harbour had to be ready to hunt a submarine whenever one was reported. A good deal of nonsense was talked about the Germans not attacking vessels in the Dover area, because they wished us to think that submarines were not passing through. A glance at the record of the German mining of the Channel, (Plate LX), will show that we knew only too well that their submarines did pass. Vessels were not attacked in the Dover area because any submarine showing a periscope was hunted, hunted, hunted, by every available destroyer for hours. It is out of all reason to imagine that the enemy would not have attacked our cross-Channel troop traffic if he had been given a chance of so doing. But the system originated by Admiral Hood, and continued by me, of hunting any boat that was reported, made the Germans very chary of showing a periscope in the Straits. The dropping of a depth-charge¹ or two is most nerve-shaking to a submarine—each explosion is apt to seem nearer than the one before—and when the hunt is continued for some hours, the time must seem very long to a submarine lying on the bottom, waiting in trepidation.

In 1915 sailings once a day only were necessary to cope with the traffic, but early in 1916 the numbers of men in France increased rapidly, and G.H.Q. asked for increased sailings to be arranged, if possible. It was highly desirable that every man should have leave once a year, if this could be managed. Life, especially life at the front, with its discomforts and dangers, was apt to become rather a hopeless blank if the end of the war were the only relief to which to look forward, whereas yearly leave was a pleasant prospect. And at one time it seemed much more likely of earlier realisation than the end of the war. I would not entertain the idea of night sailings, but we managed to squeeze in two daylight sailings on all except a very few of the worst days for tide in the winter. This meant giving up high-water sailings, which were far the safest as regards mines, and sailing at half-tide instead. Mine-

¹ A depth-charge is an explosive charge which, when dropped in the water, detonates at a pre-arranged depth.

sweeping became of greater importance, and the risks were greater. The objects to be attained were worth the extra risks.

After submarines commenced mine-laying, the laying of mine-fields on the transport route necessitated constant vigilance on the part of the Patrol. The conditions were most difficult, as the Folkestone-Boulogne route was that selected for the passage of men on leave. Two trips each way of six ships sailing with absolute regularity, each ship carrying 900 men, meant a transport of about 1,900,000 per year. This barely allowed of each man getting leave once a year. Every cancelled sailing meant loss of leave to nearly 3,000 men. Every endeavour and every legitimate risk was, therefore, taken in order to keep the daily sailings. It was very rarely that a sailing was missed. In 1917 only fifteen were missed.

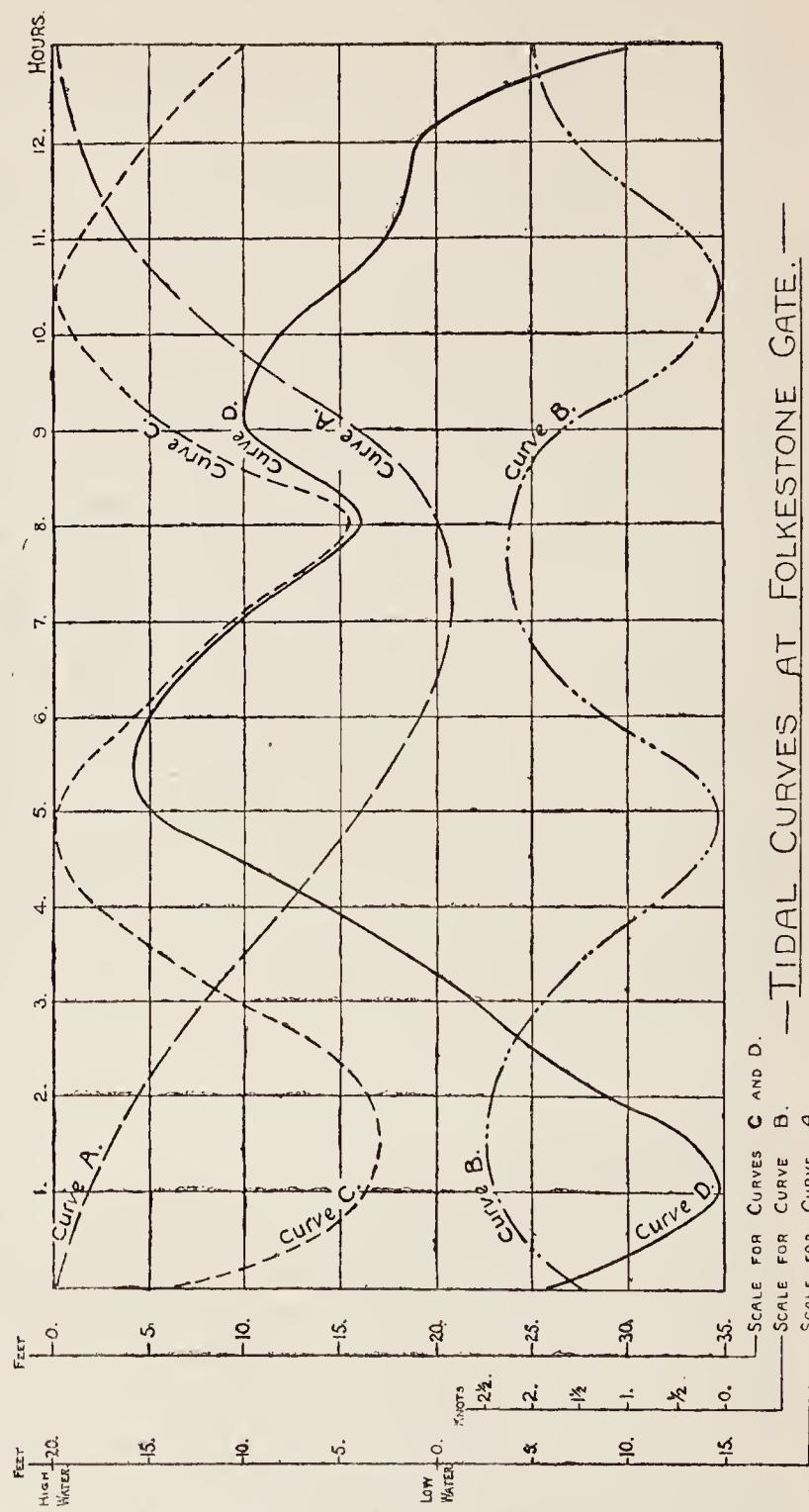
The decision as to hours which were safe for traffic and for mine-sweeping was complicated by the fact that high and low water did not correspond with slack water of the tidal streams; and the difference between these two functions of the tides varied in different portions of the patrol. The diagram overleaf gives the approximate conditions at Folkestone Gate. Curve A gives merely the ordinary rise and fall of the tide for each hour. Curve B gives the strength of the stream at the same hours. Now the depth of a mine below the surface varies according to both these influences. As the tide rises, of course, more and more water covers the mine, also the stream, as it begins to run, presses against the mine, and, as it is moored to the bottom, forces it deeper under water. Sometimes these influences work together; sometimes in opposition. As the tide rises, and the stream runs stronger, the mine from both causes recedes farther and farther from the surface. But if the stream slackens as the tide rises the mine rises, owing to the slower rate of the tide; hence, under these conditions, the two work in opposition. Curve C gives the rise and fall of the mine due to the pressure of the stream; and curve D gives the net result of the two influences on the

CURVE A, RISE AND FALL OF TIDE IN FEET FOR EACH HOUR.

CURVE B, RATE OF FLOW IN KNOTS AT EACH HOUR.

CURVE C, DEPTH OF MINE BELOW LAYING DEPTH DUE TO ACTION OF FLOW OF TIDE.

CURVE D, DEPTH OF A MINE EACH HOUR, LAID SO AS TO BE JUST AWASH IN STILL WATER AT LOW TIDE.
THE DEPTH BELOW THE SURFACE, DUE TO RISE AND FALL OF TIDE AND ACTION OF STREAM, MEASURED IN FEET.



mine. It will be seen that one hour after high water at springs, a mine moored with a length of mooring-rope exactly equal to the depth of water at low water would be 35 feet from the surface. One hour and a half before low water it would only be 4 feet below the surface. At low water it would be 14 feet ; at two hours after low water it would be 10 feet below the surface. The most dangerous time was consequently at slack water, just before low water ; after this time no mine would be less than 10 feet from the surface.

The essential considerations in fixing the time of sailing were to have sufficient water in Boulogne to float the transports in or out ; so far as mines were concerned, to have the safest water as regards height and strength of tide ; to have the route swept before the transports sailed, if that was possible ; and to avoid having the transports at sea for more than three-quarters of an hour after dark. One matter which tended to limit the transport of troops and at one time threatened to be a serious embarrassment, was the silting up of Boulogne and Folkestone with mud. The transport service was so incessant that the natural hours of dredging were interfered with, causing the water near the jetties to become considerably shallower. At the hours the transports were due to arrive, dredgers had to stop work and be removed from the fairway. This led to our running the transports, so that as far as possible the outgoing ones at Boulogne were immediately followed by the ingoing ones arriving from Folkestone, thus avoiding moving the dredgers more than was necessary ; but, in addition to this, the French were asked to continue dredging all night.

Keeping these limitations in view, it was no simple matter to arrange the time-table, especially on short winter days. Mine-sweeping could not be efficiently carried out in the dark, so that very early morning sailings were not advisable. Additional trouble arose when the hospital ships became targets for submarine activity, and they had also to be escorted. Not only did the increased number of ships add to the length

of the lines of convoy, but escorts on the Dover-Calais route also had to be instituted. It entailed severe work on the destroyers, limited in numbers, to carry out the double escort on both routes. A sample of a sailing time-table is given opposite.

It will be seen that two sailings each way took place between Folkestone and Boulogne, and one direct sailing for ambulance transports between Dover and Calais, and vice versa ; and a second trip of the ambulance transports was arranged for when required, these vessels crossing with the troop transports. The work of the escorts was as follows : taking the 1st June as an example, No. 1 escort would leave Dover at 8 a.m., with the ambulance transports, escort them to Folkestone, pick up the troop transports at 8.20, escort them to Boulogne and then leave for Calais, arriving at 11.15 in time to bring the Calais ambulance transports to Dover. At 6 p.m. they would again leave for Folkestone and Boulogne, arriving at 8 p.m., and then return to Dover for the night or for patrol as necessary.

No. 2 escort would have left so as to be at Boulogne by 9 a.m., and escorted the troops and ambulance transports to Folkestone and Dover, arriving at 11 a.m. in time to escort the ambulance transport to Calais, arriving at 12.15. The escort would then have anchored off Boulogne, or done odd jobs, and left Boulogne at 7 p.m., arriving Dover at 9 p.m.

It was the duty of the senior destroyer to whip up the transports and to see that they formed in two columns, so as to expose as short a line as possible to attack, and also to ensure that the slowest transports led the lines, otherwise the lines were certain to get ragged. A secret signal ordered all transports to proceed down Channel at maximum speed in the event of a raid.

As before mentioned, mines were an ever-present trouble. It is true the route was swept as early as possible, but often in winter there was not time to complete the sweep before the transports were due to sail. In such a case the District

SAILING TIMES FOR 1ST TO 15TH JUNE, 1917

FOLKESTONE-BOULOGNE AMBULANCE AND TROOP TRANSPORT SERVICE AND DOVER-CALAIS AMBULANCE TRANSPORT SERVICE

All Times are in British Summer Time

Date.	Ambulance Troop Transports.		Destroyers only.		Ambulance and Troop Transports.		Ambulance and Troop Transports.		Ambulance and Troop Transports.		Ambulance and Troop Transports.		Ambulance and Troop Transports.		
	Leave Dover.	Arrive Folke- stone.	Leave Boulogne.	Arrive Calais.	Leave Calais.	Arrive Dover.	Leave Dover.	Arrive Folke- stone.	Leave Boulogne.	Arrive Dover.	Leave Dover.	Arrive Folke- stone.	Leave Boulogne.	Arrive Calais.	
1	8.0 a.m.	8.20	10.0	11.15	11.15	12.30	6.0	6.20	8.0	9.0 a.m.	10.40	11.0	12.15	7.0 p.m.	8.40
2	8.0	8.20	10.0	11.15	11.15	12.30	6.0	6.20	8.0	9.0 a.m.	10.40	11.0	12.15	7.0	8.40
3	8.30	8.50	10.30	11.45	11.45	1.00	6.30	6.50	8.30	9.30	11.10	11.30	12.45	7.30	9.30
4	7.30 a.m.	7.50	9.30	10.45	10.45	Noon	2.0	2.20	4.0	8.0	9.40	10.0	11.15	2.0	3.40
5	8.0	8.20	10.0	11.15	11.15	12.30	2.30	2.50	4.30	9.0	10.40	11.0	12.15	2.30	4.10
6	8.0	8.20	10.0	11.15	11.15	12.30	2.30	2.50	4.30	9.30	11.10	11.30	12.45	3.30	5.10
7	9.0	9.20	11.0	12.15	12.15	1.30	3.30	3.50	5.30	10.30	12.10	12.30	1.45	4.0	5.40
8	9.30	9.50	11.30	12.45	12.45	2.0	4.0	4.20	6.0	11.0	12.40	1.0	2.15	5.0	6.40
9	10.15	10.35	12.15	1.30	1.30	2.45	5.30	5.50	7.30	Noon	1.40	2.0	3.15	5.30	7.10
10	11.0	11.20	1.0	2.15	2.15	3.30	5.45	6.05	7.45	12.30	2.10	2.30	3.45	6.30	7.30
11	Noon	12.20	2.0	3.15	3.15	4.30	7.0	7.20	9.0	1.30	3.10	3.30	4.45	7.0	8.40
12	12.45	1.05	2.45	4.0	4.0	5.15	7.30	7.50	9.30	2.15	3.55	4.15	5.30	7.30	9.30
13	7.0 a.m.	7.20	9.0	10.15	10.15	11.30	4.30	4.50	6.30	8.30 a.m.	10.10	10.30	11.45	5.0	6.40
14	7.30	7.50	9.30	10.45	10.45	Noon	5.0	5.20	7.0	9.0	10.40	11.0	12.15	5.0	6.40
15	9.0	9.20	11.0	12.15	12.15	1.30	5.0	5.20	7.0	10.0	11.40	Noon	1.15	5.30	7.10

Naval Transport officer always asked permission to sail. Whether I granted it before the sweep was reported depended on several things—the suitability of the weather the night before for the laying of enemy mines ; the state of the tide ; and the sweeping conditions at the entrance to the harbour. But never, if it could be avoided, was a sailing lost.

Refer for one moment to Plate LX, and look at the circles off Folkestone, off Boulogne, and on the route between the two places. Each circle represents an area in which mines were reported, yet, in spite of their number, no transport in the Dover area was ever mined.¹ Had this chart been supplied to the troops on going on board the transports, these men would probably have taken care to have their lifebelts on.

It was always an anxious time to me if I sailed transports before the sweep was reported, but to keep up the sailings this had sometimes to be done. The mine-sweepers had orders, if they found mines, to buoy the vicinity and then spread each way along the route, and warn the oncoming transports ; but there was always a good chance of the transports being close up to the sweeping. I will quote one instance from my diary :

“Jan. 17th, 1917.—Mines reported two miles S.E. $\frac{1}{2}$ E. of No. 9 buoy. As transports and the *Crusader* with gold (£5,000,000), were sailing I put them two miles clear of this spot. This meant the following telephoning—first Folkestone to stop transports sailing ; secondly, Calais to stop transports (but two had sailed) ; stop *Crusader* ; thirdly, D.N.T.O. Dover to stop *Unity* sailing with General Geddes —(but she had sailed) ; fourthly, Captain D. 6th Flotilla—to tell *Unity* and Calais escort to keep two miles clear of position of mines ; fifthly, Folkestone to warn Captain of Transports and then to sail ; sixthly, Calais to warn Captain of Transports and then to sail ; and seventhly, to Captain of Trawler Patrol to clear the mine-field.”

¹ The hospital ship *Anglia* was mined.

In this particular case, Calais, and not Boulogne, was implicated, otherwise Boulogne would have had to be dealt with also. The time available was generally short, and it was a matter of some relief to receive the report from the signal station that the various escorts had taken in the signal—and still further that the transports had arrived in harbour safely.

Six of our destroyers were mined during this period, as it was impossible to keep them from sailing for their escort and other duties until the routes had been swept. These losses, compared with the practical immunity of the transports and ambulance transports, show the value of the system of control that was in force.

The safe conduct of these troop transports required constant vigilance. That ships were never actually sunk has generally been taken as evidence that they were not attacked. There were one, if not two, raids at night on the line by enemy destroyers. There were one or two reports of cases of torpedoes actually fired at the transports, but it was always difficult to verify such reports. But there were many cases of submarines sighted in the vicinity of the route. Each class of weather required an adjustment of patrols, and unceasing hunting of submarines drove off that pest and made the locality too unhealthy; and, lastly, the abolition of nightly sailings frustrated the night-destroyer attacks. No less than forty-eight mine-fields were laid by the Germans so as to affect the Boulogne-Folkestone transports, and an additional thirty-two were dangerous to the Calais ships.

So that about eighty mine-fields were reported, discovered, and avoided without a single accident. It was no child's play, but much care on the part of all concerned led to the proud record of the Dover Patrol having passed, up to the end of December 1917, and within three hours steaming of Ostend, 5,614,500 troops across to Boulogne without the loss of a single man. Nine and a half million mail-bags were also sent over without a letter or parcel being lost at sea. During 1917, which is the only year for which an accurate record [is

available, only fifteen sailings were missed from all causes, gales, fogs, and mines. This, bear in mind, out of about 700 sailings. The number of transport sailings from Folkestone in 1917 was about 3,000.¹ In addition, during the three years, the arrivals and departures of store-carriers, troop-transports, and ambulance-transports at Dover numbered over 14,800. Of sick and wounded 810,000 were disembarked. An additional 198,000 troops were embarked or disembarked at Dover. The only casualty was the mining of the *Anglia* while sailing under the Red Cross.

Now look at the matter from the German point of view. A daylight raid *in fine weather* was possible, but would have had to be carried out in force. Their destroyers would certainly have had a scrap with our destroyers, which they should have overwhelmed, and then, as likely as not, they would have dropped up against Commodore T. and his cruisers on the way back. This was not the game they liked, and, moreover, was not a sound one unless they were prepared to send a sufficient light cruiser force South to tackle the Harwich vessels. A destroyer raid in the *usual Channel weather*, say five miles visibility, with a dozen destroyers, was a good and sound attack to attempt, but I would have defeated this, so far as the transports were concerned, by our cross-Channel barrage patrol giving warning, and, therefore, giving time to deflect the transports down Channel. Night-raids were tried by the Germans, but were disappointing to them, as we had sufficient common sense not to run at night. As regards submarine attack—always a danger in daylight—a strong escort to the transports was never omitted. Mining was defeated by the efficiency of our mine-sweepers.

Three out of five of the possible methods of attack the enemy tried, and he was defeated. I think, therefore, that the Dover Patrol may claim that the immunity of the transports was due to foresight and forestalling and hard work, and not merely to want of activity on the part of the enemy.

¹ That is, 700 sailings of about four ships each.

Nothing can excuse the Germans for not sweeping up the whole of the Dover Patrol; but, had they done so, they would have caught no transport.

Whenever His Majesty the King crossed, which he did on several occasions, special precautions and escort arrangements were adopted.

Whenever important personages travelled by a transport and not in a destroyer, a boat's crew of R.N. seamen under a lieutenant was detailed to travel in the transport, so that a boat's crew and officer of experience were available in case of accident, to save if possible these valuable lives. Needless to say, the Commander-in-Chief in France, and the Chief of Staff at G.H.Q. and in England, as well as members of the War Cabinet, were always looked after in this way.

Well, really, we thought we were doing rather well. But in December 1916 I received for remarks a letter from the Admiralty forwarding certain complaints that the War Office had received about the transport of troops. I quote my reply, as it indicates the general situation and how utterly the security in which troops were being transported had caused all ideas of the real dangers of the passage to be forgotten by those who were not at sea, confronted by all the difficulties. We were daily, almost hourly, scheming, working, frustrating, and averting real live dangers, when a bombshell arrived in the shape of this letter full of the most futile complaints. This was my reply :

“The correspondence enclosed in your letter of December 21st, 1916, fills me with amazement. It appears almost incredible that the difficulties and dangers attendant on the increased cross-Channel transport should be so little appreciated as to render it possible that complaints and suggestions, such as those forwarded by the officer in question, could have been formulated. It is, therefore, not inappropriate that I should explain, for the information of the Military Authorities, why the Transport Service between Folkestone and Boulogne cannot be run with the same regularity as a peace-service such as that which plies between Southsea and Ryde.

"The dangers to the transports on the Folkestone-Boulogne route are very real and considerable, and are of three distinct classes: (a) Destroyers attacking; (b) Mines; (c) Torpedoes from submarines. Each of these necessitates separate safeguards. The large destroyer and submarine base at Ostend is nearer this route than this route is to Brighton.

"As regards (a), I allow no night running or transports to be at sea with troops on board beyond forty minutes after dark. I have sufficient reasons, which are too technical to enter into, for fixing this time limit. This, in winter, reduces the time available for the transport of troops considerably, but it cannot be avoided.

"As regards (b). The danger from mines is great and the risk accepted in arranging the increased transport is considerable. To mitigate this risk, I have ordered:

"I. No sailings during low-water slack.

"II. No sailings, except those near high-water, over unswept routes.

"To modify these orders would be criminal.

"As regards (c). Escorts are provided. At least two destroyers are necessary for each ship sailing separately. Each three ships sailing, however, can do with three destroyers as escort, but to keep them together under this protection the slowest transport is ordered to lead, otherwise they would string out and their safety would be impaired.

"The danger of allowing transports to be alongside the open pier at Folkestone at night-time is considerable, both from submarine attack on the surface, and also a destroyer raid on a dark night. Hence, except in weather when attack is improbable, I order the transports either to Dover or the Downs for protection.

"The value of these shallow-draught, high-speed vessels is so great that they must not be risked.¹ On days except those when high-water occurs in the morning, the sweep of the route from Dover to Folkestone has to be completed before the transports can safely pass to the latter port.²

"Some further remarks may be of interest. To sweep in the dark is inefficient and dangerous. Daylight, therefore,

¹ I believe no other suitable vessels were in existence.

² This delayed the transports arriving at Folkestone to embark troops.

limits the time sweeping can be commenced. Our officers and men sweep during eighteen of the hours considered dangerous to the sweeping-vessels, in order that their comrades in the Army may get a reasonable amount of leave. This is a matter, which, if known, would be thoroughly appreciated by the Military Authorities. In order to obtain the necessary hours for sailing, I do not wait for the sweep to be reported finished before starting the transports, but have arranged for the sweepers, should they find mines, to warn the sailings in both directions. This runs matters fine, and, except for the urgency of keeping up the sailings, I would not allow this practice, which is not without its attendant risks. In fact, the margin of safety for the transport of these troops, taking the dangers and the tides into account, is cut as finely as possible. The arrangements are of considerable complexity, so much so that I deal daily with every question personally, since the chance of a disaster through a mistake is too great to be risked, and, if a mistake is made, I prefer the mistake to be mine. If I could dry the English Channel, and show to the complainants the mines and submarines, and hulls of vessels sunk during the war, further remark on the dangers would be unnecessary.

"With regard to the special remarks of the officer in question, I regret that the troops have to be exposed to the weather on occasions; but it is a preferable alternative to losing a transport.

"The afternoon sailings on December 6th were held up because Boulogne was closed by mines.

"I also regret that, on occasions, a short time only is available for transports to coal and embark troops on account of their having to sail with the slowest ship leading. The alternative is to supply six additional destroyers; but, as already seven are devoted solely to this transport work, I do not anticipate that their Lordships will be disposed to increase this to thirteen, in order to avoid the slight inconvenience mentioned.

"On December 9th, Boulogne was declared closed on account of mines. The ordinary procedure would be for all sailings to be stopped. To avoid this, and to act up fully to the spirit of the undertaking I have given to pass as many troops as possible, I put on our sweepers, who swept through

the dangerous hours, which was hardly justifiable, had it not been that I did not place much credence in the report, and it was not till 2 p.m. that I received the message that our sweep had been concluded, which information I passed personally to the D.N.T.O.'s at Folkestone and Boulogne. If the officer who forwarded the report had five minutes' inconvenience, I had many more in personal exertion to get the sailings off with a guarantee of moderate security.

"I now turn to this officer's suggestions.

"I. I decline to risk a transport unnecessarily by keeping her in an exposed position when no material benefit is derived by so doing.

"II. Even if work is thrown on the Embarkation and Rest Camp officers, I consider this preferable to sending the transports over unswept routes at wrong states of the tide at particularly dangerous hours.

III. I regret the troops should be exposed to the weather, but I am not responsible for the times of high and low water, or the physical laws which affect dangers attendant on mines.

"I cannot end without expressing the hope that the Army Council may have their attention called to the daily arduous work, real dangers, and increased responsibilities that the additional sailings have entailed on the officers and men engaged on this work in the Dover Patrol, and that they may also be requested to inform the officer in question that the regulations I lay down and enforce are not mere arbitrary whims, but are necessary to safeguard the thousands of lives that daily cross in the Transports."

Once again only were complaints made. I need only quote the last sentence of my reply.

"I submit the Army Council be moved to enquire why the information on which the letter was based, was so in opposition to fact, in order to prevent complaints of this nature being forwarded in future without reasonable justification."

One point requires remark, namely the danger of keeping transports alongside Folkestone pier at night.

The Folkestone-Boulogne ships were unique as regards tonnage, shallow draught, and speed. I believe I am correct in saying that no vessels existed to replace them had they been lost. They were, therefore, invaluable as a class. Deeper draught vessels could not have lain at the jetties which had to be used by them. To obtain these good points, bunker capacity had been cut down to the minimum, so that all the transports had to coal every time they completed a trip to France and back.

The vessels on the English side, up to the time that destroyer raids began, used to lie alongside Folkestone pier for the night. After the raid of October 1916 the question of the safety of this procedure had to be reconsidered. If the enemy destroyers raided at night and fired torpedoes blindly into Folkestone pier, they were bound to hit one or more transports and sink them. As they would be struck on the outside, they would fill that side first and list over away from the pier. This would prevent other vessels lying outside them, and taking into account the shoal extending to the eastward of Folkestone pier, they would probably block the passage to an inside berth.

For safety it was necessary to remove the transports from the pier on dark nights when a raid was possible. But where to send them? In fine weather one could lie the west side of the pier; one only could lie alongside at Dover. Dover harbour was crowded already, and the masters of the vessels, who were highly experienced in the harbour, disliked entering it at night, except in fine weather. Trawlers had to be cleared out of their anchorage to make room for them, and, in bad weather from the south-west, instead of entering the harbour, they would have to run for the Downs, already crowded, with the consequent dangers of collision. Moreover, the vessels on leaving the Downs would have to coal at Folkestone before sailing in the morning; and this meant crowding the sailings in winter weather.

Now, what were the chances of a raid ? It was quite impossible to say ; but a raid after the experience of October 26th was possible—almost probable, one might say. Would the destroyers persist in getting so near inshore ? There was no reason against this, as Folkestone Gate lights were available for fixing their position. The inconvenience to the captains, crews, D.N.T.O.'s, trawlers, and to the Transport Service generally was considerable ; but the consequences, should a raid come off, were, in my opinion, so serious that they outweighed the inconveniences. No raid ever did, in fact, come off. The inconveniences and secondary risks of collision, etc., were borne by the officers and men apparently for no useful reason. But the chance was existent, and what decided me was not the question of what these chances were—that would be merely a matter of over or under anxiousness on my part—but what the consequences would be if such a raid did succeed. This determined my action in spite of many gentle protests. All this may seem rather like making a mountain out of a mole-hill ; but, to a student of the art of commanding in war-time, particularly at sea, problems of balancing extra work on those under his command against precautions of a similar nature to those I have described should always be of real interest.

I cannot leave this subject without referring to the excellent work performed by the Senior Naval Officers and Divisional Naval Transport Officers. Of the office part of their transport work I know nothing—for these duties, they were under the Principal Naval Transport Officer in France ; but, as Senior Naval Officer at the ports where no other senior officer existed, I was their immediate chief. This was only definitely confirmed by the Admiralty towards the end of the year 1916, after Boulogne had been blocked owing to a damaged merchant vessel grounding on entering ; but, previous to this, the same relations had in fact existed. These officers were of the greatest value as a medium of communication with the local French officials, and assisted in dealing with all naval questions.

A Senior Naval Officer was appointed to Folkestone in addition to the D.N.T.O. Captain Pennant Lloyd held the post for some time, and then unfortunately was invalidated, and, I much regret to say, died shortly afterwards. He was succeeded by Rear-Admiral Bentinck J. D. Yelverton. Both these officers were of great assistance to me in dealing with the many questions which came under their jurisdiction. At Dunkirk, Captain Alfred E. H. Maresceaux, afterwards Captain W. F. Benwell, and then Captain W. F. Hamilton, transferred from Boulogne, combined with their duties an experience of bombing hard to imagine.¹ Commander H. W. Gush, and afterwards Commander J. Man, at Calais, and, on the English side, Captain George F. G. Woodhall, whose tragic death we all deplored ; and then Captain James T. Blake, full of energy and vitality ; and at Dover Captain George E. B. Bairnsfather, who, throughout the above years, had charge of the Admiralty pier, and managed most capably the hospital ship transport arrangements,—all these left their mark on the Transport Service, and in contributing to its efficiency, contributed also, in larger measure than was generally thought at the time, to the eventual victory of the forces of the Allies.

In this short—all too short—record of the movement across Channel of the British troops, we must not forget the services of the masters,² and crews of the transports who, through all weathers and dangers, navigated their vessels with the punctuality of peace-time.

The work of these seamen furnishes a good example of the quiet, unostentatious service in a war zone of ordinary British sailors, not educated to war, but of the type of those who have been the real backbone of our “carrying on” in wartime. The personnel of our Merchant Navy and Transport Services has added greatly to the reputation that our

¹ See Plate LXX.

² The names of the masters of the transports are given in Appendix VI.

country, apart from its fighting forces, has earned in centuries of warfare—of gripping, holding on, and finally emerging—spent perhaps, but victorious—from the critical wars fought to maintain our existence as a nation.

HUNTING THE SUBMARINE

With the sky above and the mine beneath, and a gale with its blast so keen,
We laughed, m'lad, and we chaffed, my lad, as we hunted the submarine.

With the sky above, and the sea above, and a void where our ship had been,
It's our pride, m'lad, to have died my lad, in hunting the submarine.

With the sky above, and the ground beneath, through our labours you walk
serene,
Set one thought aside for the lads who died in hunting the submarine.

END OF VOL. I

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